SUPPLEMENT

TO THE

BRITISH MEDICAL JOURNAL.

LONDON: SATURDAY, JULY 9TH, 1910.

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SPECIAL NOTICE TO MEMBERS.

Every member is requested to preserve this "Supplement," which contains matters specially referred to Divisions, until the subjects have been discussed by the Division to which he belongs. BY ORDER.

MATTERS REFERRED TO DIVISIONS.

British Medical Association.

AGENDA

OF

Annual Representative Meeting, 1910.

THE Annual Representative Meeting will take place in the Court of Common Council Chamber, Guildhall, King Street, Cheapside, London, E.C., on Friday, July 22nd, immediately after the Annual General Meeting, which will be held at 10 a.m.; on Saturday, July 23rd, at 9.30 a.m.; on Monday, July 25th, at 10 a.m.; on Tuesday, July 26th, at 10.30 a.m.; and on Wednesday, July 27th, if required.

In this Agenda are printed, not only Notices of Motion received not less than three months before the Annual Representative Meeting, as required by the Regulations, but also Notices of Amendments to such Motions, Motions arising out of Reports of Council or Committees, and other Motions which the Chairman finds to be in order and which were received in time for inclusion. The printing of such Amendments and Motions does not affect the position of relevant Amendments or Motions subsequently received.

H. A. BALLANCE,
Chairman of Representative Meetings.

July 5th, 1910.

A. Reception of Return of Representatives Elected.

1. **Motion: That the Return of election of Representatives of Divisions for the year 1910–11 be received, approved, and entered on the Minutes.**

2. **Motion: That the Notices (if any) of appointment of substitutes for Representatives under Article XXX and By-law 19 be received, approved, and entered on the Minutes.**

B. Standing Orders.

(For Standing Orders as adopted at Belfast, see BRITISH MEDICAL JOURNAL SUPPLEMENT of May 21st, page 242; or Minutes of Annual Representative Meeting, Belfast, page 76.)

3. **Motion: That the Standing Orders, submitted by the Chairman, be adopted as Standing Orders of the Meeting.**

The Chairman will submit the Standing Orders adopted at Belfast with the addition of the following new Standing Orders proposed by the Council, and subject to such other additions and such alterations as may hereafter be notified to the Representatives:

Section III of Standing Orders ("Procedure"): Election of Members of Council by grouped Representatives. (Proposed new Standing Orders.)

1. That the election take place at the time of the Annual Representative Meeting.

2. That a nomination for a Member of Council to be elected by any group of Representatives be required to be made by a Division or a Representative of a Division included in the group.

3. That nominations be required to be on the form appended. (See British Medical Journal Supplement of May 21st, page 245.)

4. That nominations be received up to the end of the first hour of the third day's session of the Annual Representative Meeting.

5. That there be issued to each Representative or Deputy Representative of a Constituency in the United Kingdom in attendance at the Meeting a voting paper containing the names of all candidates duly nominated for election as Members of Council by the group to which such Representative belongs.

6. That the voting paper be in the form appended. (See British Medical Journal Supplement of May 21st, page 246.)

7. That the voting papers be returned to the Medical Secretary within one hour from the commencement of the fourth day's Session of the Annual Representative Meeting.

8. That in the event of equality of votes the election be determined by the aggregate number of Members in the Constituencies represented by the voters for each candidate, as in the case of a card vote.

9. That the details of the voting be placed before and verified by the Chairman before being declared.

C. Annual and Supplementary Reports of Council.

(For Annual Report of Council, 1909–10, see British Medical Journal Supplement of May 21st, 1910, page 248. For Supplementary Report of Council, see pages 40–45 of this Supplement.)

4. **Motion:** That the Annual Report of the Council for the year 1909–10, and Estimate of Income and Expenditure for the year 1910, be received.

5. **Motion:** That the Supplementary Report of the Council for the year 1909–10 be received.

6. **Motion** (By the Chairman): That all Motions by Divisions or Branches which relate to matters dealt with in the Annual Report of Council be considered as amendments or riders to the Recommendations, if any, to which they are relevant, or to the Motion: "That the remainder of the Report under the heading . . . be approved."

7. **Motion:** That paragraphs 1 to 4 of the Annual Report of the Council be approved.

8. **Motion:** That the Financial Statement and Balance Sheet for the year 1909 be approved.

9. **Motion:** That paragraph 7 of the Annual Report of Council (Estimate of Receipts and Expenditure for 1910) be approved.

10. **Motion:** That paragraph 8 of the Annual Report of Council (Apportionment of Members' Subscriptions) be approved.

11. **Motion:** That paragraph 9 of the Annual Report of Council (Issue of Supplement to Non-members) be approved.

12. **Motion:** That paragraphs 10 to 13 of the Annual Report of Council (Control of Advertisements in Journal) be approved.

13. **Motion:** That paragraph 14 of the Annual Report of Council (Duties of Secretariat) be approved.

14. **Motion:** That paragraphs 15 to 20 of the Annual Report of Council (*re* Accident Policy in connexion with British Medical Journal) be approved.

15. **Motion:** That paragraph 22 of the Annual Report of Council (Medical Benevolence) be approved.

16. **Motion:** That paragraphs 23 to 27 of the Annual Report of Council (the British Medical Journal) be approved.

Articles in "British Medical Journal."

17. **Rider** by Chelsea Division:

That this Meeting requests the Council to cause to be inserted on the leader page of every issue of the Journal a disclaimer, stating that the views expressed in the articles therein, represent the opinions of the writer only, and not necessarily those of the general body of the British Medical Association; and that all articles be signed.

(Supplement, April 23rd.)

Articles and Letters forwarded by Members to "British Medical Journal."

18. **Rider** by Rochdale Division:

That the Journal of the British Medical Association is, among other things, the medium for expressing the views of its Members, and if any article or letter be excluded, the Editor should reply within a reasonable time, stating the reason for its exclusion. If the Member be not satisfied with the explanation, the question shall be referred to the Journal Committee.

(Supplement, April 23rd.)

19. **Motion:** That paragraph 1 of the Supplementary Report of Council "as to Finance" be approved (page 40 of this Supplement).

ORGANIZATION.

Capitation Grants.

20. **Motion:** That the following Recommendation of Council be adopted (paragraph 38 of Annual Report, British Medical Journal Supplement of May 21st, page 259).

That, concerning the following Motion, submitted by a Division to the Annual Representative Meeting, 1909, and referred by that Meeting (Minute 195) to the Council for consideration, namely:

194. That in view of the facts (1) that the policy of the Association is to consider the Division as the primary unit, each Division being free to govern itself in such manner as it shall think fit; (2) that the decision as to what additional subjects shall be forwarded to the Divisions for consideration rests with the Representative Body and the Central Council, and not the Branch Councils, this Representa-

tive Body considers that it is illogical any longer to place in the hands of Branch Councils the funds for distribution to the Divisions, while at the same time depriving them of any control over the objects for which the money is used, and instructs the Central Council to so amend the By-laws as to place the distribution in the hands of the Central Council, which can make Capitation Grants to all Divisions and Branch Councils as may be required,

it is inadvisable to adopt the policy referred for the consideration of the Council.

Election of Representatives.

21. **Motion:** That the following Recommendation of Council be adopted (paragraph 41 of Annual Report):

That the Meeting approve of the principle that each Constituency elect at least one Representative and (in the United Kingdom) an additional Representative for each 100 members after the first 50, and that on a card vote the voting power of a Constituency which has more than one Representative be equally divided among all the Representatives of that Constituency.

Formation of British Medical Students' Union.

22. **Motion:** That the following Recommendation of Council be adopted (paragraph 49 of Annual Report):

That the instruction contained in Minute 197 of the Annual Representative Meeting, 1909, relative to the formation of a British Medical Students' Union, be continued.

Appointment of President of Association.

23. **Rider** by ROCHDALE DIVISION:

That, with regard to the appointment of the President of the British Medical Association, the Representative Meeting resolves that the Council should consider the question of the abolition of the custom of choosing the President from the place in which the Annual Meeting is held, and the fact that eminence in the scientific side of the profession should not outweigh years of strenuous work on behalf of the Association. They should also bear in mind in appointing to this—the highest honour—that of the 22,000 Members by far the greatest majority are general practitioners.

(SUPPLEMENT, April 23rd.)

24. **Motion:** That the remainder of the Annual Report of Council under heading "Organization" (paragraphs 28 to 54) be approved.

Procedure for Election of Members of Council.

25. **Rider** (in connexion with paragraph 44 of Annual Report of Council, *see* page 260 of BRITISH MEDICAL JOURNAL SUPPLEMENT of May 21st) by CITY DIVISION:

That with reference to By-law 43 (3) of the Draft New By-laws of the Association, as to Mode of Election of twenty-four Members of Council by Groups of Branches in United Kingdom, it be an instruction to the Council to consider whether the form of voting papers should contain particulars of nominations whether by Divisions or Members.

Membership.

26. **Rider** by ROCHDALE DIVISION:

That there be two grades of subscriptions—one as at present, to include membership of Association and JOURNAL; and one, say at 10s. 6d. annually, to include membership and the SUPPLEMENT of the JOURNAL only, and that the Council be instructed to take the necessary steps for the requisite alterations of the Regulations of the Association.

(SUPPLEMENT, April 23rd.)

(For report of Journal and Finance Committee on foregoing Motion *see* Supplementary Report of Council, paragraph 1, page 40 of this SUPPLEMENT.)

27. **Rider** by WIGAN DIVISION:

That in order to bring as large a number of the profession as possible into close touch with Medical Politics and Sociology there shall be two kinds of membership of the Association:

(*a*) Full membership at present rate with the existing privileges.

(*b*) Part membership at, say, ten shillings a year, which should entitle such Member to attend Divisional and general Branch meetings and to receive the SUPPLEMENT weekly, but not the JOURNAL itself.

(SUPPLEMENT, April 23rd.)

(For report of Journal and Finance Committee on foregoing motion *see* Supplementary Report of Council, paragraph 1, page 40 of this SUPPLEMENT).

28. **Rider** by DUNDEE BRANCH:

That no Member shall be able effectively to resign his membership while any discussion as to the conditions of professional employment is in progress between the Association and any organized body, public or other, affecting the area of his Branch or Division, and that it be an instruction to Council to prepare the necessary amendments of the Articles and By-laws.

(SUPPLEMENT, April 23rd.)

29. **Rider** by GLASGOW EASTERN DIVISION:

That it be an instruction to the Council to consider the advisability of the following alteration of present Article VIII of the Association:

That the first six lines of present Article VIII be deleted, and the following words, or words to similar effect, substituted:

"Any member whose subscription shall not have been paid on or before the 30th June of the current year shall receive a second notice asking for payment, and if subscription is still unpaid by 30th September, he shall, without prejudice to his liability to the Association, be suspended from all privileges of membership, and at the end of the year, if the arrears be still unpaid, he shall, *ipso facto*, cease to be a member."

Grouping.

(*For grouping of Branches not in United Kingdom for 1910–11, as determined by Council, see* BRITISH MEDICAL JOURNAL SUPPLEMENT *of May 21st, page 246.*)

30. **Motion** (from the Chair): That the Grouping of Divisions and Branches in the United Kingdom for the election of Members of Council for the year 1911–12 be the same as for the year 1910–11.

31. **Motion** (from the Chair): That the Grouping of Divisions and Branches not in the United Kingdom for the election of Members of Council for the year 1911–12 be the same as for the year 1910–11.

32. **Rider** (arising out of paragraph 43 of Annual Report, "Grouping of Branches not in United Kingdom," British Medical Journal Supplement of May 21st, page 260) by Bombay Branch:

That the present grouping of Indian Branches with Burma, Hong Kong, China, and Ceylon Branches will cause a great delay in any communication likely to be carried on between the grouped Branches. That it would be better to give one Member to the following Branches—namely, Bombay, Punjab, South Indian and Madras and Assam; and another to the other Branches—namely, Burma, Colombo, Ceylon, and Hong Kong and China.

(Supplement, April 23rd.)

33. **Rider** (arising out of paragraph 43 of Annual Report, "Grouping of Branches not in United Kingdom," British Medical Journal Supplement of May 21st, page 260) by Cape of Good Hope—Western Province Branch:

That the South African Branches, including over 500 Members, be represented by one member of Council.

(Supplement, April 23rd.)

Elections.

34. **Rider** by Dundee Branch:

That it be an instruction to the Council to take the necessary steps for the adjustment of the Regulations of the Association so as to provide as far as possible for the conduct of all elections in the Association by the method of the transferable vote.

(Supplement, April 23rd.)

Matters Referred to Divisions.

35. **Rider** (arising out of Report of Council under heading "Organization") by West Suffolk Division:

That in the opinion of the Representative Meeting it is desirable, as a means of awakening fresh interest in the work of the Association, that when matters are referred to Divisions in the Supplement of the Journal, a blank leaf, naming the subjects, should be inserted in the same Supplement, and attention called to it in the "Special Notice to Members."* Upon this leaf any Member who is unable to attend the meeting of his Division, when these subjects are placed on the agenda, may write his opinion and send it to the Secretary of his Division to be considered at the meeting.

*[Existing Form of Special Notice to Members.

Every member is requested to preserve this Supplement, which contains matters specially referred to Divisions, until the subjects have been discussed by the Division to which he belongs.

Words Proposed by West Suffolk Division to be Added.

"If unable to attend the Division meeting, he should write his opinion on the blank leaf attached, and send it to the Secretary of his Division."]

(Supplement, April 23rd.)

36. **Motion**: That paragraph 2 of the Supplementary Report of Council, as to Application for a Charter (see page 40 of this Supplement), be approved.

37. **Motion**: That the Meeting approve and adopt, as a Report of the Representative Meeting to the Association, the Memorandum submitted by the Council to the Meeting on the history of the application of the Association for a Royal Charter.

38. **Motion**: That the following Recommendation of Council be adopted (paragraph 3 *b* of Supplementary Report, pages 40–1 of this Supplement):

That the Annual Representative Meeting authorize the Council, after submitting the draft Memorandum of Association to the Divisions, to settle the terms thereof in accordance with the replies of the Divisions, and to proceed forthwith to take the steps necessary to the formation of a new Company, incorporated in the same manner and having the same Articles of Association and By-laws as the present Company as constituted at the time of application, but with a Memorandum of Association as hereinbefore stated.

39. **Motion**: That the remainder of the Supplementary Report of Council under the heading "Organization" (paragraphs 3–7, pages 40–1 of this Supplement) be approved.

SCIENCE.

40. **Motion**: That the following Recommendation of Council be adopted (paragraph 55 of Annual Report, British Medical Journal Supplement of May 21st, page 269):

That, having regard to the considerable facilities for research which at present exist in various parts of the country, and the heavy financial requirements of such an undertaking, it is inadvisable for the British Medical Association to attempt to establish a Central Research Laboratory.

41. **Motion**: That the remainder of the Annual Report of Council under heading "Science" (paragraphs 55 to 61) be approved.

42. **Motion**: That the Supplementary Report of Council under heading "Science" (paragraphs 9–15, pages 41–2 of this Supplement) be approved.

MEDICAL ETHICS.

43. **Motion**: That the following Recommendation of Council be adopted (paragraph 63 of Annual Report, page 270 of British Medical Journal Supplement of May 21st).

That having regard to the replies received from the Divisions, the Representative Meeting does not deem it advisable to proceed at present to the drafting of any regulations to govern a special class of consultants.

44. **Amendment** by Kensington Division:

That the Representative Meeting await the final report of the Council with the completed returns from the Divisions as to a special class of consultants before coming to a decision, and that in their final report the Council be requested to analyse the returns from the different Divisions, showing the nature and size of the Divisions making the respective replies.

45. **Motion**: That the remainder of the Annual Report of Council under heading "Medical Ethics" (paragraphs 62 to 72, pages 270–271 of British Medical Journal Supplement of May 21st) be approved.

Ethics of Consultation.

46. **Rider** (in connexion with paragraph 64—Ethics of Consultation) by Salford Division:

That the following principles dealing with the ethics of medical consultation be approved:

(*a*) When a patient who has not previously been seen in consultation calls on a consultant at his rooms without introduction from a general practitioner, inquiry should be made in every case as to whether the patient is under the care of any practitioner.

(*b*) If it is ascertained that the patient is not under the care of another practitioner, there is nothing ethically wrong in the consultant prescribing at his rooms for the patient; but it is inadvisable for any practitioner who wishes recognition as a consultant to attend any patient at the patient's own house except in co-operation with a general practitioner.

(*c*) If it is ascertained that the patient is under the care of another practitioner, it is the duty of the consultant to use every endeavour to persuade the patient to allow him to communicate with the attending practitioner, but should the patient refuse this permission, the consultant has the right to make an examination and to express an opinion, but not to undertake the treatment of the case.

(SUPPLEMENT, April 23rd.)

Uniform Ethical Rules for Association.

47. **Rider** by WATFORD AND HARROW DIVISION:

That it is desirable that all Members of the Association should be bound by a uniform Code of Ethical Rules instead of having varying codes for different Divisions.

(SUPPLEMENT, April 23rd.)

48. **Rider** by EAST YORK DIVISION:

That in view of the inadequate and inefficient support accorded to a Division of the Association which has passed a Resolution in terms of Rule Z, uniform Ethical Rules common to the whole of the Association be adopted as rapidly as possible.

Supporting Local Profession.

49. **Rider** by EAST YORK DIVISION:

That in cases where action sanctioned by the Central Ethical Committee is taken by any Division of the Association under Rule Z, it shall be binding upon all Members of the Association to support such action so far as is within their power.

Relation of Association to Homœopaths.

50. **Motion:** That the following Recommendation of Council be adopted (paragraph 16 of Supplementary Report, p. 42 of this SUPPLEMENT):

1. That the Association should not attempt to pronounce, in connexion with the question of homœopathy, or in any other connexion, what constitutes sound doctrine in medicine or surgery, nor condemn individual practitioners on the ground that they hold peculiar views of pathology or treatment, or give effect to such views in the practice of their profession.

51. **Motion:** That the following Recommendation of Council be adopted (paragraph 16 of Supplementary Report, p. 42):

2. That in the opinion of the Representative Meeting it is contrary to the recognized principles of professional conduct for any medical practitioner to advertise the holding of peculiar views of pathology or treatment, or the fact that his practice is based thereon, as a means of attracting to himself patients.

52. **Motion:** That the following Recommendation of Council be adopted (paragraph 16 of Supplementary Report, p. 42):

3. That, accordingly, the Representative Meeting express its disapproval of the conduct of those medical practitioners who permit the publication of their names in the *Homœopathic Directory* or similar compilations, or who make use of door-plates or similar means to intimate to the public that they are guided in their practice by peculiar theories of pathology or treatment.

53. **Motion:** That the following Recommendation of Council be adopted (paragraph 16 of Supplementary Report, p. 42–3):

(4) That practical effect be given to the foregoing Resolutions by an expression of opinion of the Representative Meeting as follows: (*a*) That it is desirable that the bodies which have the power of electing Members should not elect those who are reasonably believed to have acted unprofessionally in any of the ways stated; and (*b*) that, concerning those who are already Members, the disciplinary powers of the Council and of the Branches should be duly exercised if, and when, cases of the kind are brought under their notice in conformity with the ordinary Rules of Procedure of the Association in ethical matters.

Position of Practitioners Examining on Behalf of Interested Persons.

54. **Motion:** That the Interim Report of Council on the Position of Medical Practitioners examining on behalf of Interested Persons be received.

(See p. 46 of this SUPPLEMENT.)

55. **Motion:** That the Interim Report of Council on the Position of Medical Practitioners examining on behalf of Interested Persons be provisionally approved.

Warning Notice.

56. **Motion:** That the following Recommendation of Council be adopted (paragraph 21 of Supplementary Report, p. 43 of this SUPPLEMENT):

That, in the opinion of the Representative Meeting, it is the duty of Members of the Association, and of those Members of the medical profession who desire to co-operate with the Association for the maintenance of the honour and interests of the medical profession, to apply for information in accordance with the terms of the Warning Notice in respect to any appointment referred to in that Notice, and to take such action in respect of the information or advice received, in response to such application, as may be most conducive to the maintenance of the honour and interests of the profession.

57. **Motion:** That the remainder of the Supplementary Report of Council under heading "Medical Ethics" (paragraphs 16–22, pp. 42–3 of this SUPPLEMENT) be approved.

MEDICO-POLITICAL.

Rules of Nursing Associations.

58. **Motion:** That the following Recommendation of Council be adopted (paragraph 87 of Annual Report, page 272 of BRITISH MEDICAL JOURNAL SUPPLEMENT of May 21st):

That the following Model Rules for inclusion in the Rules of District Nursing Associations be adopted in place of those approved by the Annual Representative Meeting, 1909 (Minute 128):

1. The nurse shall in every case carry out the directions of the Registered Medical Practitioner in attendance.

2. The nurse, when requested in an emergency, may visit and render first aid to any person without awaiting instructions from a doctor.

3. If, in the nurse's opinion, the attendance of a doctor is necessary, she must insist that he be sent for; and if for any reason his services are not immediately available, she must, if the case be still one of urgency, remain with the patient and do her best until he arrive, or until the emergency is over.

Should the advice to call in a doctor be not acted upon, the nurse must at once leave and report the case to her Secretary, and must not attend again except in case of fresh emergency.

4. Should any further attendance be requested by the patient after the emergency is over, the nurse must explain that the doctor will decide whether or not this is necessary.

5. No attendance after a first visit shall be given by a nurse unless she has informed a doctor and received his instructions with regard to the case, if any.

6. Apart from her duties as a certified midwife, a nurse must on no account prescribe or administer on her own responsibility such drugs for her patients as should only be prescribed by a medical man.

7. It is desirable to obtain the co-operation of all the medical men in the district, and in the larger associations to obtain, if possible, the assistance of one or more of them on the Committee.

(Attention is drawn to the fact that the machinery of the local Divisions of the British Medical Association is available for this purpose.)

8. No midwife in the employment of a Nursing Association should accept an engagement without first asking the patient to state, and herself registering, the name of the doctor to be called in should any emergency arise.

9. A nurse shall in no case attempt to influence a patient in the choice of a doctor.

10. No person shall be employed by the ..... Association as a midwife, or received for training as a midwife, without having first signed an agreement not to practise as a midwife within a radius of ..... miles from ..... within a period of ..... after leaving the service of the Association, without the consent in writing of the Association.

(Note.—For the Model Rules as adopted at Belfast *see* page 247 of British Medical Journal Supplement of May 21st.)

Instruction in Hygiene, Nursing, First Aid, etc.

59. **Motion:** That the following Recommendation of Council be adopted (paragraph 101 of Annual Report):

That members of the Medical Profession should be suitably remunerated for teaching subjects in connexion with the Public Health, such as Nursing, First Aid to the Injured, and Hygiene, and that the fee adopted by the London County Council of £1 1s. for each lecture is one which appears suitable for general adoption.

Ambulance Lectures to British Red Cross Society.

60. **Rider** by Winchester Division:

That a fee should be charged for ambulance lectures given to the British Red Cross Society, and that the fee be £5 5s. for each course of lectures.

(Supplement, April 23rd.)

61. **Motion:** That the remainder of the Annual Report of Council under heading "Medico-Political" (paragraphs 73 to 112) be approved.

Prescribing by Chemists.

62. **Rider** (in connexion with paragraph 97 of Annual Report of Council, page 273 of British Medical Journal Supplement of May 21st, Unqualified Practice—Appointment of Royal Commission) by East Norfolk Division:

That the British Medical Association should take immediate steps to stop illegal prescribing by chemists, as also the indiscriminate sale by them of abortifacients.

(Supplement, April 23rd.)

Parliamentary Representation.

63. **Rider** by Chelsea Division:

That this Meeting recognizes the necessity for a Union of Medical Practitioners with Parliamentary representation, and requests the Council of the British Medical Association to ascertain the wishes of Members in the United Kingdom by referendum at the earliest possible date.

(Supplement, April 23rd)

Treatment of School Children found Defective.

64. **Motion:** That the Special Report of Council on the Treatment of School Children found upon Inspection to be Defective be received.

65. **Motion:** That the Special Report of Council on the Treatment of School Children found upon Inspection to be Defective be provisionally approved.

Centrally Controlled Provident Medical Service.

66. **Motion:** That the Interim Report of the Poor Law Reform Committee on the question of a Centrally Controlled Provident Medical Service (Minute 118 of Annual Representative Meeting, Belfast) be received.

67. **Motion:** That the Interim Report of the Poor Law Reform Committee on the question of a Centrally Controlled Provident Medical Service be provisionally approved.

Reports of Departmental Committee on Coroners' Law, etc.

68. **Motion:** That the Special Report of Council on the Reports of the Departmental Committee on Coroners' Law be received.

Riders by Coroners' Juries to Their Verdicts.

69. **Motion:** That the following Recommendation of Council be adopted (paragraph 13 of Special Report of Council on Reports of Departmental Committee):

That the Association continue its efforts to prevent the passing by Coroners' Juries of riders which include reflections upon the conduct of individuals who have not been afforded the opportunity of giving evidence on their own behalf.

70. **Amendment** by Manchester (South) Division:

That whereas the Report of the Coroners Departmental Committee recognizes the appending of a rider by the jury to their verdict, and in view of the fact that a rider is a judgement (frequently carrying with it a severe penalty) on one who is not on trial, who has no opportunity of defence and who may be absent or entirely ignorant of what is taking place, and is therefore an infraction of every principle of law and justice, it be an instruction to the Council to oppose to the uttermost in future legislation any such right of a jury to add a rider.

(Supplement, April 23rd.)

71. **Motion:** That the following Recommendation of

Council be adopted (paragraph 24 of Special Report of Council on Reports of Departmental Committee):

That the Representative Meeting instruct the Council to approach the Lord Chancellor and the Home Secretary and press upon them the views of the Association in reference to death certification and registration and the Coroner and his court, and to take all steps necessary to secure adequate reforms therein.

72. **Motion:** That the remainder of the Special Report of Council on the Reports of the Departmental Committee on Coroners' Law (paragraphs 1–24) be approved.

73. **Motion:** That the remainder of the Supplementary Report of Council under heading "Medico-Political" (paragraphs 23–34, pp. 43–45) be approved.

PUBLIC HEALTH AND POOR LAW.

74. **Motion:** That the Annual Report of Council under heading "Public Health and Poor Law" (paragraphs 113–124, pp. 275–276 of BRITISH MEDICAL JOURNAL SUPPLEMENT of May 21st) be approved.

Medical Officers of Health.

75. **Rider** (arising out of paragraphs 113–115 of Annual Report of Council) by RICHMOND, ROCHDALE, and SALFORD DIVISIONS:

That Minute 234 of the Annual Representative Meeting, 1909, be rescinded.

[*Minute 234 Referred to.*

Resolved: That the Recommendation of the Committee, as amended, be approved, namely:

That in the interests of the public health, and in view of the multiplicity of duties thrown upon medical officers of health by recent enactments, it is desirable that, in future appointments, medical officers of health should be required to devote their whole time to the duties of their office, and be debarred from private practice, except as consultants; that they should be adequately paid, and, if necessary, districts should be grouped for the purpose; and that it is further desirable that medical officers of health should be protected in carrying out their duties, and be secured from capricious dismissal or reduction of salary, and that they be allowed to participate in any superannuation scheme approved by a Local Government Board.)

(SUPPLEMENT, April 23rd.)]

[For the Report which was before the Annual Representative Meeting, 1909, and upon consideration of which the above Resolution was carried, *see* BRITISH MEDICAL JOURNAL SUPPLEMENT of May 21st, pp. 247–248.

76. **Rider** by ROCHDALE DIVISION:

That in the interests of public health medical officers of health should have security of tenure, and that in all boroughs and large urban districts, where practicable, whole-time appointments be made with adequate salary.

(SUPPLEMENT, April 23rd.)

Medical Appointments in Public Medical Services in General.

77. **Rider** by SALFORD DIVISION:

That in every form of public medical service the system of part-time appointments of medical practitioners should be maintained as far as such appointments can be made consistently with the requirements of the services, and that all public medical officers should be protected in carrying out their duties, should be secured from capricious dismissal or reduction of salary, and should be allowed to participate in any superannuation scheme approved by a Local Government Board.

(SUPPLEMENT, April 23rd)

Pathological Branch of Public Health Service.

78. **Rider** by BRIGHTON DIVISION:

That the Central Council of the Association do seek information from the Divisions as to the need for a pathological branch of the Public Health Service, and report on the same to the Annual Meeting of 1911.

(SUPPLEMENT, April 23rd.)

79. **Motion:** That the Supplementary Report of Council under heading "Public Health and Poor Law" (paragraphs 35–38, page 45 of this SUPPLEMENT) be approved.

HOSPITALS.

Payment for Compensation Certificates.

80. **Motion:** That the following Recommendation of Council be adopted (paragraph 125 of Annual Report of Council (BRITISH MEDICAL JOURNAL SUPPLEMENT of May 21st, p. 276).

That the fee for a certificate of the kind referred to in Minute 148 of the Representative Meeting, 1909, should not be less than one guinea.

[Minute 148 of Annual Representative Meeting, 1909, referred to:

148. Resolved: That, in the opinion of the Representative Meeting, any member of an honorary or paid medical or surgical staff of a hospital who signs any certificate or gives any report on any case under the Workmen's Compensation Act, ought to receive personally the usual fee in full.]

81. **Motion:** That the remainder of the Annual Report of Council under heading "Hospitals" (paragraphs 125–130) be approved.

Payment of Hospital Staffs.

82. **Rider** by WINCHESTER DIVISION:

That the Council be instructed to prepare a Report for consideration of the Divisions and the Representative Meeting on the advisability of all members of the Staffs of Voluntary Hospitals being paid for their services.

(SUPPLEMENT, April 23rd.)

83. **Motion:** That the Supplementary Report of Council under heading "Hospitals" (see paragraphs 39–40, p. 45 of this SUPPLEMENT) be approved.

NAVAL AND MILITARY.

84. **Motion:** That the Annual Report of Council under heading "Naval and Military" (paragraphs 131–4, BRITISH MEDICAL JOURNAL SUPPLEMENT of May 21st, pages 276–277) be approved.

85. **Motion:** That the Supplementary Report of Council under heading "Naval and Military" (paragraph 41, page 45 of this SUPPLEMENT) be approved.

SCOTLAND.

86. **Motion:** That the Annual Report of Council under heading "Scotland" (paragraphs 135–8, page 277, of BRITISH MEDICAL JOURNAL SUPPLEMENT of May 21st) be approved.

87. **Motion:** That the Supplementary Report of Council under heading "Scotland" (paragraph 42, p. 45 of this SUPPLEMENT) be approved.

IRELAND.

88. **Motion: That the Annual Report of Council under heading "Ireland" (paragraphs 139–40, page 277 of BRITISH MEDICAL JOURNAL SUPPLEMENT of May 21st) be approved.**

THE BRANCHES OUTSIDE THE UNITED KINGDOM.

89. **Motion: That the Annual Report of Council under heading "The Branches outside the United Kingdom" (paragraphs 141–4, page 277 of BRITISH MEDICAL JOURNAL SUPPLEMENT of May 21st) be approved.**

90. **Motion: That the Supplementary Report of Council under heading "The Branches outside the United Kingdom" (paragraphs 43–5, p. 45 of this SUPPLETENT) be approved.**

GENERAL APPROVAL OF ANNUAL AND SUPPLEMENTARY REPORTS OF COUNCIL.

Annual Report.

91. **Motion: That, subject to the Amendments and other Resolutions adopted by the Meeting with reference thereto, the Annual Report of Council be approved as a whole.**

Supplementary Report.

92. **Motion: That, subject to the Amendments and other Resolutions adopted by the Meeting with reference thereto, the Supplementary Report of Council be approved as a whole.**

D. Other Special Reports of Council (if any).

E. Election of Officers.

Elect a Chairman of Representative Meetings and a Deputy Chairman of Representative Meetings for the year 1910-11.

F. Election of Council.

(i) Election of 12 Members of Council by Grouped Representatives, pursuant to By-law 23 (*c*). [For Nomination Forms and Voting Papers *see* pages 245, 246 of BRITISH MEDICAL JOURNAL SUPPLEMENT of May 21st.]

(ii) Election of 4 Members of Council by Representative Meeting, pursuant to By-law 23 (*d*).

(iii) Election of 3 Members of Council by Representative Meeting, pursuant to By-law 23 (*e*), to represent Royal Navy Medical Service, Army Medical Service, and Indian Medical Service.

G. Election of Committees.

Election by Representative Meeting, pursuant to By-law 41, of members of Finance, Organization, Journal, Central Ethical, Medico-Political, Public Health, Hospitals, Naval and Military, and Colonial Committees; and other Committees, if any.

H. Standing Orders.

Consider proposed amendments of Standing Orders, other than those relating to the order of business.

I. Any other Business.

J. Confirm Minutes.

By Order,

J. SMITH WHITAKER,
Medical Secretary.

SUPPLEMENTARY REPORT OF COUNCIL.

FINANCE.

MOTIONS INVOLVING EXPENDITURE FOR CONSIDERATION AT ANNUAL REPRESENTATIVE MEETING, 1910.

1. In accordance with the Standing Orders approved by the Annual Representative Meeting at Belfast, with regard to Motions on the Agenda of the Representative Meeting involving special expenditure, the Council submits a report by the Journal and Finance Committee on the following Motions placed by the Rochdale and Wigan Divisions respectively on the Agenda of the Annual Representative Meeting, 1910.

Rochdale.

That there be two grades of subscriptions—one as at present, to include membership of Association and JOURNAL; and one, say at 10*s.* 6*d.* annually, to include membership and the *Supplement* of the JOURNAL only; and that the Council be instructed to take the necessary steps for the requisite alterations of the Regulations of the Association.

Wigan.

That in order to bring as large a number of the profession as possible into close touch with Medical Politics and Sociology, there shall be two kinds of membership of the Association:—

(*a*) Full membership at present rate with the existing privileges.

(*b*) Part membership at, say, ten shillings a year, which should entitle such member to attend Divisional and General Branch Meetings and to receive the *Supplement* weekly, but not the JOURNAL itself.

Both Motions are to the effect that there should be two grades of membership—"full" members being in the position of present members; whereas "part" members would be entitled to all privileges of membership of the Association and to the receipt of the *Supplement* of the JOURNAL, but not of the JOURNAL itself.

In the opinion of the Journal and Finance Committee, Members of the new class would not pay their fair share of the working expenses of the Association; the actual saving to the Association resulting from not having to supply the JOURNAL to them would be little more than the cost of the paper on which the JOURNAL is printed. On the other hand the value of the JOURNAL as an advertising medium would be seriously depreciated upon it becoming known that it was no longer circulated to all the members of the Association. As regards the expenses of membership, apart from the supply of the JOURNAL, the Annual Report of the Council shows that the expense of producing and supplying the JOURNAL to each member is 6*s.* 3*d.* per head, while 18*s.* 9*d.* is applied to the general work of the Association, the benefits of which it is proposed that this class of members should continue to enjoy.

ORGANISATION.

APPLICATION FOR CHARTER.

2. In view of the refusal of the Privy Council, already reported to the Special Representative Meeting, to grant the Charter applied for by the Association, the Council has prepared a Memorandum of the history of the application of the Association for a Charter, and of the opposition thereto, which is submitted with this Report for the consideration of the Annual Representative Meeting.*

SPECIAL REPRESENTATIVE MEETING.

3. The Council has considered the following resolutions of the Special Representative Meeting held on Tuesday, June 28th, 1910:—

Minute 24.—Resolved (by 94 votes to 2): That the Draft Articles and By-laws be approved as a whole, in accordance with the foregoing Resolutions, and that

* Will be circulated to members of the meeting.

the Chairman be authorised to submit the same to the Extraordinary General Meeting to be held on Wednesday, June 29th, 1910, and to the necessary confirmatory Extraordinary General Meeting, in order that they may be adopted, in accordance with the requirements of the Companies Acts, as the Regulations of the Association in substitution for all existing Regulations.

Minute 37.—Resolved (*nem. con.*): That the Council be instructed to take all necessary steps with a view to the formation of a new Company, under the title of the British Medical Association, incorporated in the same manner as the existing Company, but with a Memorandum of Association providing for all the powers and objects which are detailed in the Draft Charter applied for by the Association, subject to the following amendments and additions, namely:—

(*a*) That if the use of the word "registers" in Sub-Clause 2 (2) (iii) is considered to interfere with the statutory functions of the General Medical Council, the word be omitted and some other word used, if necessary, to define the wishes of the Association.

(*b*) That if the use of the word "or" in line 2 of Sub-Clause 2 (2) (iv) of the Draft Charter be held by the legal advisers of the Association to restrict the Association to the publication of one Journal only at one and the same time, such words be used as will permit the Association, if it so desire, to have at the same time more than one Journal or other periodical.

(*c*) That with respect to Sub-Clause 2 (2) (vi) of the Draft Charter such words be added as may be necessary to enable the Association, should it think fit, to support in whole or in part any Member of Parliament or of any British Legislative Assembly during his term of office.

(*d*) That such additions be made as will allow the Association, should it at any time be decided by the Members to be desirable, to establish, endow, contribute to, organise or manage any system of Insurance of members of the community against the cost of medical treatment for themselves, their families, and dependants.

New Articles and By-laws.

3 (*a*). The new Articles and By-laws of the Association approved by the Representative Meeting were adopted on Wednesday, June 29th, by the requisite majority of an Extraordinary General Meeting of Members of the Association convened in accordance with the Companies Acts, and if this Resolution be confirmed by a majority of the second Extraordinary General Meeting, to be held at 2 p.m. on Friday, July 22nd, they will become the Articles and By-laws of the Association as at present constituted.

Proposed New Company.

3 (*b*). Concerning Minute 37 of the Representative Meeting, the Council has given instructions for the preparation of a draft Memorandum of Association, which will be submitted to the Annual Representative Meeting, and it is hoped that by this means and by the adoption of the procedure indicated in the following Recommendation, the Divisions will be afforded every opportunity of considering the extended Memorandum of Association, while the Association will be saved the expense, and the Representatives the inconvenience involved in the holding of a further Special Representative Meeting:—

Recommendation.

That the Annual Representative Meeting authorise the Council, after submitting the draft Memorandum of Association to the Divisions, to settle the terms in accordance with the replies of the Divisions, and to proceed forthwith to take the steps necessary to the formation of a new Company, incorporated in the same manner and having the same Articles of Association and By-laws as the present Company as constituted at the time of application, but with a Memorandum of Association as hereinbefore stated.

Capitation Grants.

4. Upon full consideration of the information afforded by the Annual Reports and Financial Statements of Branches in the United Kingdom which have furnished such reports for the year 1909, and of the average expenditure of each Branch for the past three years, the Council has made grants at the rates of from two shillings to four shillings per head, according to the requirements of each Branch, to those Branches which have furnished reports and appear to the Council to need grants in order to meet the expenditure of the current year. The Council has not thought it necessary to make grants to those Branches which had in hand on December 31st, 1909, a sufficient amount to meet expenses for the current year equivalent to the average of the past three years and to leave a substantial surplus in hand on December 31st, 1910.

5. To the Branches outside the United Kingdom a uniform grant has been made of four shillings per head.

6. The total grants which the Council has made amount to £766 14*s.* 6*d.* for the Home Branches, and £808 18*s.* 0*d.* to the Branches outside the United Kingdom.

7. If any Branches in the United Kingdom appear to the Council to require further grants in order to meet the expenditure necessary for the work of the current year, these will be made up to the limit of four shillings per head imposed by the By-laws.

Grouping of Colonial Branches.

8. Communications have been received from various Branches outside the United Kingdom, objecting to the method, determined by the Council in January, of the grouping of these Branches for the purpose of election of Members of the Central Council. As the matter is raised in the Agenda of the Annual Representative Meeting by Motions from two of these Branches, the Council summarises for the information of the Meeting the replies which have been sent to certain Branches which have sent in objections. These were to the effect (i) that the decision of the matter will in future rest with the Representative Meeting; (ii) that the liberty either of the Council or of the Representative Meeting in dealing with the matter is restricted by the fact that the aggregate number of Representatives on the Council, of Branches outside the United Kingdom is restricted to seven, this reduction in the number of Representatives of these Branches corresponding to the reduction which has also been made in the number of Members of Council representing Branches in the United Kingdom, and the number now fixed for Branches outside the United Kingdom having been agreed to by the Representatives of Colonial Branches in the Special Representative Meeting held in London in May, 1907, when the provisions of the present By-law were determined; (iii) that some of the difficulties of which the Colonial Branches complain are necessary incidents of any system of grouping, inasmuch as provision must be made for those Branches or topographically associated groups of Branches, which are too small to enjoy independent representation; and (iv) that no practical hardship results in respect of the procedure of election, inasmuch as voting is by post, there is ample time for making all arrangements for nomination, the election is by voting paper, and all expenses are defrayed from the Central Funds.

SCIENCE.

Central Library.

9. The Lending Department of the Library, to which reference was made in paragraph 58 of the Annual Report of Council, is now open, so far as Periodicals, Transactions, and Monographs are concerned, to all Members of the Association under the following conditions:—

1. No book shall be issued except to a Member whose address is registered with the Financial Secretary and Business Manager.

2. A Member desiring to borrow a book or periodical shall make an application to the Librarian, in writing, which application shall be filed by the Librarian, who shall forward the book as soon as it is available.

3. A Member requiring a book to be forwarded shall send with his application sixpence for packing and carriage.

4. Books shall not be retained for a period exceeding fourteen days without special permission of the Librarian, and any book in the custody of a member shall be despatched carriage paid within twenty-four hours of the receipt of a written application from the Librarian for its return.

5. All books must be returned to the Librarian on or before July 15th in every year, and none shall be issued between that day and the first day of September next following. No Member may borrow more than four volumes at a time.

6. Ordinary text-books can only be consulted at the Library. Only works of reference will be circulated.

7. Each borrower will be held liable for loss of, or damage to, any work while in his possession.

Note.—It will not be possible to undertake to lend fasciculi of current volumes of periodicals.

10. The Council trusts that this extension of the facilities afforded to Members in connection with the Library of the Association will be justified by the large number of Members who will make use of the Lending Department.

Chloroform Committee.

11. The Special Chloroform Committee which was appointed in July, 1901, has issued its final Report (*see* p. 47 of this Supplement). It is intended to republish it in book form, together with the appendices containing the papers written by various members of the Committee.

Stewart Prize.

12. The Council has awarded the Stewart Prize to Major George Lamb, I.M.S., Director of the Pasteur Institute of India, and Senior Member of the Plague Research Commission in India, in recognition not only of his own work, but also of the entire work of the Commission and of every Member thereof.

13. The Stewart Prize is awarded not oftener than every two years, from the proceeds of a sum of £400 left by the late Alexander Patrick Stewart, M.D., the objects of the Trust being the recognition of important work done, or instituted, regarding the origin, spread, and prevention of epidemic disease.

Middlemore Prize.

14. The Council has decided that the Middlemore Prize shall be awarded in 1911 to the writer of the best essay on "Serum and Vaccine Therapy in connection with Diseases of the Eye."

15. The Middlemore Prize is awarded triennially, from the proceeds of a sum of £500 left in trust to the Association by the late Richard Middlemore, F.R.C.S., to the writer of the best essay on the Scientific and Practical Value of Improvements in Ophthalmic Medicine and Surgery (made or published) during the previous three years.

MEDICAL ETHICS.

The Relation of the Association to Homœopaths.

16. The Council issued to the Divisions in February, 1910, a Report on the Relation of the Association to Homœopaths (see *Supplement*, February 12th, pp. 65–66). Up to the time of preparation of the present Report, 87 Divisions have replied. Their replies are to the following effect:—

Question A.

Is the Division of opinion that the Association should not attempt to pronounce in this or in any other connection what constitutes sound doctrine in medicine or surgery, nor condemn individual practitioners on the ground that they hold peculiar views of pathology or treatment, or give effect to such views in the practice of their profession?

Answers.

Affirmative, 78. Negative, 5. No answer, 4.

Question B.

Is the Division of opinion that the Association should express the opinion that it is contrary to the recognised principles of professional conduct for any medical practitioner to advertise the holding of peculiar views of pathology or treatment, or the fact that his practice is based thereon, as a means of attracting to himself patients?

Answers.

Affirmative, 79. Negative, 4. No answer, 4.

Question C.

Is the Division of opinion that the Association should express its disapproval of the conduct of those medical practitioners who permit the publication of their names in the Homœopathic Directory or similar compilations, or who make use of door-plates or similar means to intimate to the public that they are guided in their practice by peculiar theories of pathology or treatment?

Answers.

Affirmative, 67. Negative, 9. No answer, 4.

(Also 6 who had no objection to Homœopathic Directory, and 1 Division which was equally divided on the question.)

Question D.

If the reply of the Division to the above questions *B* and *C* is in the affirmative, is the Division of opinion that it is desirable that the bodies which have the power of electing members should not elect those who are reasonably believed to have acted unprofessionally in any of the ways stated?

Answer.

Affirmative, 60. Negative, 4. No answer, 23.

Question E.

In the same event as stated in the previous question, is the Division of opinion that, concerning those who are already Members, the disciplinary powers of the Council and of the Branches should be duly exercised if, and when, cases of the kind are brought under their notice in conformity with the ordinary Rules of Procedure of the Association in ethical matters?

Answer.

Affirmative, 44. Negative, 11. No answer, 32.

Recommendation.

The Council **recommends**:—

(1) That the Association should not attempt to pronounce, in this or in any other connection, what constitutes sound doctrine in medicine or surgery, nor condemn individual practitioners on the ground that they hold peculiar views of pathology or treatment, or give effect to such views in the practice of their profession.

(2) That the Association should express the opinion that it is contrary to the recognised principles of professional conduct for any medical practitioner to advertise the holding of peculiar views of pathology or treatment, or the fact that his practice is based thereon, as a means of attracting to himself patients.

(3) That, accordingly, the Association should express its disapproval of the conduct of those medical practitioners who permit the publication of their names in the Homeopathic Directory or similar compilations, or who make use of door-plates or similar means to intimate to the public that they are guided in their practice by peculiar theories of pathology or treatment.

(4) That if the above recommendations (2) and (3) are approved, practical effect should be given to them by an expression of opinion of the Representative Meeting: (*a*) that it is desirable that the bodies which have the power of electing Members, should not elect those who are reasonably believed to have acted unprofessionally in any of the ways stated; and (*b*) that, concerning those who are already Members, the disciplinary powers of the Council and of the Branches should be duly exercised if, and when, cases of the kind are brought under their

notice in conformity with the ordinary Rules of Procedure of the Association in ethical matters.

POSITION OF PRACTITIONERS EXAMINING ON BEHALF OF INTERESTED PERSONS.

17. An Interim Report (*see* p. 46) has been prepared and issued to the Divisions, dealing with the subject of the following instruction of the Annual Representative Meeting at Belfast :—

> That the Council be instructed to prepare and submit to the Divisions a Report on the position of medical practitioners who are called upon to examine, on behalf of employers, insurance companies, and persons similarly interested, patients who are under the care of other practitioners.

Upon consideration of the replies of the Divisions, a further report will be prepared and submitted to the Representative Meeting. In the meantime, the Council considers that a preliminary discussion of the subject in this year's Annual Representative Meeting will be of advantage.

PRESENTATION OF CASES TO THE GENERAL MEDICAL COUNCIL.

18. The Annual Representative Meeting, in 1906, decided as follows :—

> That it is absolutely necessary, in the interests of the Medical Profession, that the Association should take up cases of a penal nature before the General Medical Council as complainants.

This decision was confirmed by the Annual Representative Meeting in 1907.

19. Until the present year, no cases had been brought under the notice of the Association which appeared to the Central Ethical Committee (to which the Council have delegated the duty of dealing with the matter) to be of such a nature, or to be supported by such evidence, as to justify submission by the Association to the General Medical Council. At the May Session of the Council this year the Association appeared as complainant in the following cases, with the results stated :—

(*a*) A case, to which attention was drawn by the Sheffield Division, of a medical practitioner who employed his dispenser, a person not medically qualified, to attend in confinement a patient whom the practitioner had engaged to attend. The patient died from septicæmia, the result of retention of placenta. In view of the circumstances of the attendance on the deceased by an unqualified person, the Medical Officer of Health brought the matter to the notice of the coroner, who obtained sanction for exhumation of the body, and held an inquest. The jury included in their verdict a finding that the patient ought to have been attended by a qualified medical practitioner. The Division asked that the Association should take the necessary steps to secure an inquiry into the case by the General Medical Council on account of the public scandal which had been occasioned, the members of the Division considering that it would be invidious for them, either as a Division or individuals, to appear before the General Medical Council as complainants.

The Council found the facts alleged in the complaint of the Association to be proved, and directed the erasure of the name of the practitioner from the Medical Register.

(*b*) A case, to which attention was drawn by the Nottingham Division and the Midland Medical Union, of a medical practitioner who persistently, and after warning, was a party to canvassing in association with a medical aid society established by a collecting insurance company.

The practitioner against whom complaint was made, admitted, through his Solicitor, the substantial accuracy of the allegations of the Association, explained that the canvassing had taken place without his knowledge or approval, but admitted his responsibility therefor, expressed his regret, and undertook not to repeat the offence. In consideration of these admissions and this undertaking, the Medical Secretary, on behalf of the Association, and with the approval of the Chairman of the Central Ethical Committee who was present, decided not to produce his evidence before the Council, and the case was withdrawn with the consent of the Council.

(*c*) A case brought under notice by the Council of the Metropolitan Counties Branch, as well as by various individual members of the profession, of a practitioner who is associated as a medical officer and as a member of the Committee of Management with an Institution called "The Eye and Ear Clinique," at which patients are charged fees of 5*s.* and 10*s.* 6*d.*, and which advertises widely in newspapers for patients.

The case was partly heard and adjourned by the Council for further consideration at the November Sessions, in order that the accused might produce further evidence.

20. In the opinion of the Council these cases illustrate the utility, and indeed the necessity, of the Association taking the action which it decided in 1907 to take of appearing as complainant before the General Medical Council.

WARNING NOTICE.

21. The Council, after prolonged consideration of the Standing Orders governing the publication of Warning Notices in the BRITISH MEDICAL JOURNAL, has adopted new Standing Orders, devised, chiefly, with the object of securing more effective central control over the conditions of insertion of such Notices, without impairing the necessary promptitude of action in urgent cases. The Council considers it desirable that the position of the Association should be clearly defined as regards the effect which the appearance of a Warning Notice with respect to any appointment should have upon the consideration of any question of professional conduct arising out of the acceptance of that appointment.

The Council **recommends**:—

> That the Representative Meeting express the opinion that it is the duty of Members of the Association, and of those Members of the medical profession who desire to co-operate with the Association for the maintenance of the honour and interests of the medical profession, to apply for information in accordance with the terms of the Warning Notice in respect to any appointment referred to in that notice, and to take such action in respect of the information or advice received, in response to such application, as may be most conducive to the maintenance of the honour and interests of the profession.

HAMPSTEAD HOSPITAL.

22. In view of questions arising out of the Hampstead Hospital dispute which may require the consideration of the Representative Meeting, the Council has authorised the circulation to the Representatives of documents which were before the Council when it considered the case in January last.

MEDICO-POLITICAL.

MEDICAL TREATMENT OF SCHOOL CHILDREN FOUND UPON INSPECTION TO BE DEFECTIVE.

23. The provisional scheme for the Medical Treatment of School Children, referred to in paragraph 83 of the Annual Report of the Council as in course of preparation, has now been circulated to the Honorary Secretaries of Divisions, with an indication that copies will be supplied for distribution when any Division has the matter under consideration, and with a request to each Division to consider the matter (*a*) as regards the general policy of the Association, and (*b*) as regards any local action which the Division may think desirable. The Report is submitted to the Representative Meeting[1] for preliminary discussion.

[1] The report has already been circulated to the Divisions.

RECOMMENDATIONS OF THE DEPARTMENTAL COMMITTEE ON THE WORKING OF THE MIDWIVES ACT, 1902.

24. The Recommendations of the Departmental Committee on the working of the Midwives Act have been carefully considered, and the Council is glad to report that in the main they agree with the views which have been expressed by the Representative Meeting, and which were placed before the Departmental Committee by the witnesses of the Association. An important difference between the Recommendations of the Committee and the policy of the Association is in respect of the authority which should deal with the payment of medical men called in by midwives.

25. In view of the introduction of the Midwives Bill of the Government, the Council has made representations to the Lord President of the Council and the President of the Local Government Board to the following effect, and has asked that a deputation be received from the Association :—

(*a*) That payments to medical men summoned in cases of emergency on the advice of midwives be made, pending reform in the Poor Law, by the Local Supervising Authorities, and not by the Poor Law Authorities as recommended by the Departmental Committee.

(*b*) That, upon receipt of a declaration from the Medical Practitioner in attendance that he is unable to obtain payment of his fee from the patient or her representatives, the Local Authority should pay the fee to the Medical Practitioner, and should itself be empowered, if thought fit, to charge the fee paid as "relief on loan."

(*c*) That the scale of fees should be fixed by order of the Local Government Board.

(*d*) (i) That the recommendation as to a system of uniform fees in emergency cases contained in (*b*) (6) of the Departmental Committee's Recommendations be not approved; and (ii) that the term "any ordinary after attendance" be defined by the Local Government Board as meaning not more than three subsequent visits.

26. It has also been decided that in the event of the adoption of an Act containing the above provision (*c*) the Association shall press upon the Local Government Board the adoption of the following scale :—

	£	*s.*	*d.*
Visit (including any necessary prescription)—			
Day (7 a.m. to 7 p.m.)	0	3	6
Night (7 p.m. to 7 a.m.)... ...	0	7	6
Attendance at cases without operative interference and three subsequent visits, if necessary	1	1	0
Attendance at cases of operative interference and three subsequent visits, if necessary	2	0	0
Assistance for the administration of an anæsthetic	1	1	0
Travelling Expenses.			
For attendance at a case more than 1 mile from the Practitioner's registered address; for each mile or part of a mile	0	2	0

NOTE.—The above are minimum fees. Powers should be obtained to pay special fees in special cases with the consent of the Local Government Board.

THE MEDICAL PROFESSION AS A CAREER.

27. The following Resolution of the Representative Meeting, 1909, having received the consideration of the Council,

That the following Motion be referred to the Council for consideration and action at their discretion :—

That having considered the reference from the Council contained in paragraph 24 of the Supplementary Report of the Council (p. 132), the Representative Meeting request the Council to consider the advisability of drawing the attention of headmasters of schools to the overcrowded conditions of the medical profession, and the small income received by many medical men after much expenditure of time and money.

A letter has been drawn up for circulation to the Headmasters of schools.

CONFERENCE WITH THE REPRESENTATIVES OF THE BRITISH PHARMACEUTICAL CONFERENCE.

28. The Conference between Representatives of the Association and Representatives of the British Pharmaceutical Conference, to which reference was made in paragraph 105 of the Annual Report of the Council, met on May 19th, 1910, at the Offices of the Association, under the Chairmanship of the Chairman of Council, when the following points were discussed :—

(*a*) Medical Dispensing—its extent—whether it should be transferred to pharmacists, and, if so, how the transfer could be effected;

(*b*) The nature and extent of prescribing by unqualified persons, and the means by which it may be prevented;

(*c*) The possibility of co-operation in action concerning the sale of dangerous, secret, or useless nostrums;

and the following Resolution was carried :—

Minute 5.—That the Members of this Conference recommend to their respective bodies the institution of a Joint Standing Committee consisting of at least ten Members of the British Medical Association and the British Pharmaceutical Conference to be elected at the Annual Meeting of each Association; and that meantime this Conference adjourn and delegate to the Chairman and Secretaries the work of preparation leading up to the institution of the said Joint Standing Committee.

29. The Council has approved the appointment of a Standing Joint Committee, consisting of at least ten Members of the British Medical Association and ten Members of the British Pharmaceutical Conference.

PUBLIC MEDICAL SERVICE.

30. The Annual Representative Meeting, 1909, resolved:—

Minute 118.—"That the following Motion be referred to the Council for consideration and report :—

That the time is now opportune for the British Medical Association to take into consideration the drafting of a scheme for Public Medical Services, to embrace Philanthropic Dispensaries and Medical Services, School Clinics, the Poor Law Medical Service, Provident Dispensaries, and the Medical Services of Friendly Societies and Clubs."

This instruction has received prolonged consideration from the Medico-Political Committee and also from the Special Poor Law Reform Committee as a matter arising out of the discussion of the Reports of the Royal Commission on the Poor Law. Owing to the importance and complexity of the subject it has not been found possible to prepare a report in time for issue to the Divisions before this year's Annual Representative Meeting, but it is hoped to circulate an Interim Report to the Representatives in order that a preliminary discussion may take place in that Meeting.

REPORTS OF DEPARTMENTAL COMMITTEE ON CORONERS LAW, &C.

31. After careful consideration of the Reports of the Departmental Committee on Coroners Law, &c., and comparison of these Reports with the Memorandum of Evidence of the Association, the Council submits for the consideration of the Representative Meeting a Special Report[1] containing Recommendations as to the future action of the Association in regard to this important subject.

ACTION TAKEN IN CONTRACT PRACTICE CASES.

32. Since the issue of the Annual Report of Council action has been taken in connection with the following Contract Practice Appointments :—

Cwmtillery (Collieries Medical Officer), East Kirkby and Kirkby-in-Ashfield (Friendly Societies' appointment), Bradninch Club appointments.

[1] Will be circulated to members of the Meeting.

ACTION TAKEN IN SCHOOL MEDICAL OFFICER APPOINTMENTS.

33. Action, not previously reported to the Representative Meeting, has been taken in respect to the following public appointments :—

Ilkeston (Lady School Medical Officer and Assistant Medical Officer of Health), Aberdeen (Chief Medical Inspector), Gloucestershire (Lady School Medical Officer), and Inverness County (School Medical Officer).

CENTRAL EMERGENCY FUND.

34. The Central Emergency Fund began the year 1909 with a balance in hand of £74 12*s.* 6*d.* By subscriptions from January 1st to December 31st, 1909, the sum of £222 13*s.* was received, by subscriptions from January 1st, 1910, to June 22nd, 1910, £187 6*s.* 10*d.*, making a total of £484 12*s.* 4*d.* for a year and a half.

Payments amounting to £300 have been made to the South Wales Branch Fund for Ebbw Vale, £30 has been paid to the Birmingham Branch for the Coventry dispute, and £30 to the Norwich Division for the assistance of a Member concerned in a dispute with certain Friendly Societies.

There is thus a balance in hand of £124 12*s.* 4*d.*

PUBLIC HEALTH AND POOR LAW.

PUBLIC HEALTH OFFICERS BILL.

35. As mentioned in paragraph 115 of the Annual Report of the Council, the Public Health Officers Bill of the Association has been redrafted, and arrangements are being made for its introduction into Parliament.

MEDICAL OFFICERS OF HEALTH SUPERANNUATION BILL.

36. Clauses which provided for the Superannuation of Medical Officers of Health were removed from the Old Public Health Officers Bill of the Association under the advice of supporters in Parliament, who thought the question should be dealt with separately. The Council has now drafted a Bill, which it is hoped to introduce into Parliament during the present Session.

PREMIUM-PAYING ASSISTANT MEDICAL OFFICERS OF HEALTH.

37. A question has arisen as to the insertion in the BRITISH MEDICAL JOURNAL of an advertisement for an Assistant Medical Officer of Health (pupil), for whom a premium was required. The Council is of opinion that it is undesirable that a premium-paying pupil of a Medical Officer of Health should in any circumstances be designated "Assistant Medical Officer of Health," and instructions have been given to decline advertisements of the kind.

ACTION TAKEN WITH REGARD TO PUBLIC HEALTH AND POOR LAW APPOINTMENTS.

38. Action has been taken with regard to the following Public Appointments not previously reported to the Representative Meeting : Radstock (Medical Officer of Health), and Midlothian, Linlithgow, and Peebles (Assistant Medical Officer of Health).

HOSPITALS.

REPRESENTATION OF LOCAL MEDICAL PROFESSION ON BOARDS OF HOSPITALS AND SIMILAR BODIES.

39. In accordance with the Instruction contained in Minutes 157 and 158 of the Representative Meeting, Belfast, the Council has directed the issue of a circular.[1]

Minute 157.—"That, in the opinion of the Representative Meeting, the association of officially recognised representatives of the local medical profession in the promotion and general management of hospitals and other medical charities is desirable in the interests of those institutions as well as of the profession, and that for the appointment of such representatives use should be made of the machinery afforded by a Division of the British Medical Association."

Minute 158.—"That it be an instruction to the Central Council to prepare a scheme for the nomination and election of representatives in accordance with the above Resolution, and to submit the same for the approval of the Divisions and of this Body."

[1] This is being circulated to the Divisions.

OUT-PATIENT DEPARTMENTS OF LONDON HOSPITALS.

40. In view of the fact that it is proposed by the Council of the King Edward VII Hospital Fund to appoint a Committee to enquire into the question of Out-Patient Departments of London Hospitals, the Council has instructed the Hospitals Committee to co-operate with the Metropolitan Counties Branch in preparing evidence for submission at the proposed enquiry.

NAVAL AND MILITARY.

SERVICE REPRESENTATION IN COUNCIL.

41. In accordance with By-law 23 (*d*) the Council makes the following nominations for the election by the Representative Meeting of Members of Council representing the Services :—

Royal Navy Medical Service.

Insp.-Gen. Robert Bentham, R.N.
Dep. Insp.-Gen. W. Bowden, R.N., D.S.O.

Army Medical Service.

Surg.-Gen. Sir Alfred Keogh, K.C.B.
Lieut.-Col. F. W. H. Davie-Harris, R.A.M.C.

Indian Medical Service.

Surg.-Gen. W. R. Browne, C.I.E., I.M.S.
Surg.-Gen. J. P. Greany, I.M.S.

SCOTLAND.

MIDWIVES (SCOTLAND) BILL.

42. The Scottish Society of Medical Officers of Health has submitted for the consideration of the Council a Draft Midwives (Scotland) Bill. The Bill has been referred to the Scottish and Medico-Political Committees.

THE BRANCHES OUTSIDE THE UNITED KINGDOM.

MEDICAL REGISTRATION IN INDIA.

43. The Council has considered an application for advice from the Bombay Branch concerning a Draft Bill for the Registration of Medical Practitioners in the Bombay Presidency, forwarded to the Branch by the Surgeon-General to the Government of Bombay. The principal point upon which the Branch desired advice was as to the inclusion in the Register of certain classes of medical practitioners known as "Hospital Assistants" and "Military Assistant Surgeons."

44. The Council has communicated to the Secretary of State for India its opinion that the time has now arrived when there should be a system of Medical Registration covering the whole of India and Burma. In informing the Bombay Branch of this action, the Council has expressed the opinion that no system of registration would be complete which did not include Military Assistant Surgeons and Hospital Assistants.

MEDICAL REGISTRATION IN THE EAST AFRICA PROTECTORATE.

45. The Secretary of State for the Colonies has forwarded for the observations of the Association a proposed Ordinance for the Registration of Medical Practitioners and Dentists in the East Africa Protectorate, and the observations of the Association were duly forwarded. The Council would take this opportunity of expressing its appreciation of the action of the Colonial Office in thus systematically affording the Association a means of expressing professional opinion upon questions of medical legislation in His Majesty's Dominions beyond the Seas.

REPORT OF COUNCIL

ON

POSITION OF MEDICAL PRACTITIONERS CALLED UPON TO EXAMINE (OTHERWISE THAN BY THE REQUEST OF THE PATIENT OR PERSONS ACTING UPON HIS BEHALF) PATIENTS WHO ARE UNDER THE CARE OF OTHER PRACTITIONERS.

REFERENCE.

THE Annual Representative Meeting passed the following Resolution, which has been referred by the Council to the Central Ethical Committee, and by the Central Ethical Committee to the Standing Subcommittee, for consideration and report:

> *Minute* 40*a*.—That the Council be instructed to prepare and submit to the Divisions a Report on the position of medical practitioners who are called upon to examine, on behalf of employers, insurance companies, and persons similarly interested, patients who are under the care of other practitioners.

MEMORANDUM.

I. *Question of* locus standi.—Any right of one person to employ a medical practitioner to make an examination and report on the health of another will usually arise under (*a*) a contract of employment, including those which fall within the purview of the Workmen's Compensation Act, or (*b*) a contract of insurance. It may suffice for the present to confine the consideration of the subject to these groups of cases.

II. The fundamental difference between the relations to one another of the medical practitioners concerned in a case of the kind under consideration and that of the practitioners in an ordinary consultation, such as was dealt with in the Report on the Ethics of Consultation, arises from the fact that in an ordinary consultation the practitioners taking part are all engaged in the interest of the patient, whereas in the cases to be dealt with in the present Memorandum they act for persons whose interests are divergent. Each medical practitioner is concerned in the interests of the person who employs him. Their rights and duties in respect of one another, apart from ordinary courtesy and the consideration which members of the profession are in every case bound to show to one another, depend upon the rights, and the obligations to one another, of those for whom they act.

III. It is necessary, therefore, to consider briefly what are the rights and duties of the persons in whose interests the medical practitioners are respectively acting.

IV. Of the cases in which the examination in question is made in connexion with a contract of employment a large number arise under the Workmen's Compensation Act. In these cases the rights of the employer and of the workman, as regards the medical examination of the latter by doctors employed by the former, are to a great extent defined by statute. The workman will forfeit his claim to compensation if he throws any unreasonable difficulty in the way of his examination by the employer's doctor in the manner prescribed. On the other hand, the employer cannot demand as part of his statutory rights that any examination should be carried out in a manner which may injure the workman's health, of which the workman's doctor is the recognized guardian.

V. Other cases in which an employer may claim to satisfy himself, by an examination made by a doctor acting in his interest, as to the state of health of a workman, are those in which the question is to be determined of the workman's fitness for employment, apart from any question of compensation. In these cases, again, a workman has to consider whether it is more to his interest to submit himself to examination by the employer's doctor or to risk losing his employment. If he decide that it is to his in terest, on the whole, to be examined, it is clear that hi s doctor can claim no right to interpose any difficulties in the way of examination other than those which are necessary for the protection of the workman's health.

VI. In insurance cases the person or company who have incurred a liability to pay compensation in respect of disease or injury are entitled to satisfy themselves by medical examination, by a doctor employed by them, as to the extent of such disease or injury, and the patient by refusing unreasonably to submit himself to examination, risks forfeiting his right to compensation. It is reasonable that he should be protected against injury in connexion with the examination, and he may demand, if he think proper, that his own doctor should be present at the examination to watch his interest in this and any other respect.

VII. In view of the considerations above stated it may be assumed for the purpose of the present Report that in every case which requires consideration in the Report the patient is satisfied, before any question of relations of the two doctors arises, that it is to his interest to submit himself to examination, and the medical practitioner who acts on his behalf can claim no rights upon grounds of medical ethics or medical etiquette, the exercise of which would conflict with the interest of the patient.

VIII. On the other hand, any rules of which the Association may express approval should be so framed as to tend by their operation to secure that the interests of the patient shall be properly safeguarded through the agency of the doctor employed by him.

IX. For convenience, the two practitioners concerned are spoken of in the following paragraphs and Rules as the "Medical Inspector" and the "Medical Attendant" respectively.

X. It may be the duty of the Medical Inspector to make such examination and enquiries as will enable him to report upon any of the following matters:

(*a*) Present state.
(*b*) Etiology of any existing disorder.
(*c*) Prognosis.
(*d*) Treatment.

XI. It will be the duty of the Medical Attendant:
(i) To give any information which his patient may authorize him to give.
(ii) To facilitate the examination in every way consistent with the patient's welfare.

SUGGESTED RULES.

The following Rules are suggested as complying with the principles above stated:—

(1) Except as hereinafter mentioned, the Medical Inspector should give the Medical Attendant such notice of the date, time, and purpose of his visit as will afford reasonable opportunity for the Medical Attendant to be present should he or the patient so desire.

The exceptions are—
(*a*) When circumstances justify a surprise visit.
(*b*) When circumstances necessitate a visit within a period which does not afford time for notification.

(2) The Medical Attendant must not put any unnecessary difficulties in the way of fixing a time convenient to both practitioners.

(3) If the Medical Attendant fails to appear at the time appointed, the Medical Inspector may proceed with his examination forthwith.

(4) The Medical Inspector must not, without the consent of the Medical Attendant, do anything in the course of his examination which involves active interference with the treatment of the case. Examples of improper interference would be the removal of dressings or splints.

(5) The Medical Inspector must not make any comments to the patient which are of the nature of criticisms of, or reflections upon, the treatment, nor must he express, without the concurrence of the Medical Attendant, any opinion to the patient as to the etiology, diagnosis, or prognosis of the case. His duty is strictly confined to examining into such matters as are necessary for the purpose of his report, and reporting to his employer, and to his employer only, his conclusions from such examination.

British Medical Association.

FINAL REPORT

OF

SPECIAL CHLOROFORM COMMITTEE.

SECTION I.

INTRODUCTION.

AT the Annual General Meeting of the British Medical Association held at Montreal in 1897, Dr. A. D. Waller, F.R.S., delivered an address upon anaesthetics. He insisted that it was all-important to appreciate the great power of chloroform, and that of the deaths which occur during its use many were avoidable and so were unjustifiable. He pointed out that when the power of chloroform was recognized—and by recognition he meant the recognition in numerical values—the preventable deaths would not occur.[1] In 1898 he returned to this subject in a communication made to the (then) Society of Anaesthetists,[2] in which he dealt mainly with the question of the accurate dosage with chloroform during anaesthetization by that drug. He says, "Successful chloroform anaesthesia requires the regular respiration of air in which the chloroform vapour is maintained between the limits of 1 and 2 per 100." In May, 1901, Dr. Waller wrote the subjoined letter to the Council of the British Medical Association:

Weston Lodge,
16, Grove End Road, N.W.
May 20th, 1901.

To the President and Council of
The British Medical Association.

SIRS,

I am anxious to again bring under the serious consideration of the B.M.A. the question of accidents during anaesthesia.

The numerous attempts to obtain further knowledge and consequent diminution of death-rate are well-known to me, and I do not think the time, labour, and money bestowed upon inquiry into the subject have produced the result hoped for, viz: a diminution of death-rate. Nevertheless, I believe that one clear fact has come to light, viz., that deaths (chiefly under chloroform) are in the overwhelming majority of instances attributable to overdose.

When, however, an attempt is made to teach this important principle by an appeal to numerical data, it is found that such data are not in existence.

We do not know by direct experiment how much chloroform is contained in the body of an animal fully "anaesthetized" to a surgical degree, or deliberately anaesthetized to death. Nor does any thoroughly well tested quantitative method exist by which these principal facts could be determined. I venture to think that it would greatly contribute to diminish danger if it should be clearly established that accidental death is due to accidental overdose, and if data could be obtained enabling us to estimate and teach what are "sufficient" and "excessive" quantities of absorbed chloroform under given conditions.

I do not think that such knowledge would be of *direct* value to the practical anaesthetist, but I do believe that its *indirect* value in laying the foundations of his knowledge, and affording a positive basis of teaching, would ultimately be very great. And I consider that a rough, but wholly impartial, indication of the influence of such knowledge might be looked for in the annual death-rate under anaesthesia, as returned in the reports of the Registrar-General.

On these grounds, in particular on the ground that this method of approaching the subject has not yet been adopted, I venture to suggest to the Council of the Association the formation of a small Committee with the definite and restricted instruction *to study the methods of quantitative determination of chloroform in air, in fluids, and in the bodies of animals variously chloroformed.*

I venture further to suggest that a definite problem of this nature will require not merely close and critical control by experienced members of such a committee, but the undivided attention and daily work of some one person giving his undivided attention to the subject, and that the nature of the inquiry is such that the Council of the Association or its Scientific Grants Committee may think fit to devote to it one of the Research Scholarships of the Association.

I am, Sirs,
Your obedient servant,
(Signed) AUGUSTUS D. WALLER.

[1] BRITISH MEDICAL JOURNAL, November 20th, 1897.

[2] *Proceedings*, vol. i, p. 72; also BRITISH MEDICAL JOURNAL, April 23rd, 1898

It was resolved by the Council[3]:

1. **That a Special Chloroform Committee be appointed to investigate methods of quantitatively determining the presence of chloroform in the air and in the living body.**
2. **That the Special Chloroform Committee have power to co-opt two members, and enter on an expenditure of £100.**

The Council of the British Medical Association[4] further appointed the Committee[5] to consist of Dr. Barr (now Sir James Barr), Dr. Dudley Buxton, Sir Victor Horsley and Professor A. D. Waller with the instruction to "investigate methods of quantitatively determining the presence of chloroform in the air and in the living body." The Committee co-opted two members, viz, Mr. A. Vernon Harcourt, F.R.S., sometime Reader in Chemistry at Christ Church, Oxford, and subsequently Professor Dunstan, F.R.S, and these joined the Committee.

The object of the reference was made more plain and the work of the Committee led into more obviously practical lines by the suggestion of Sir Victor Horsley conveyed in a letter to the Council of the Association and adopted. The addition to the reference ran, "and determine if possible what is the minimal dose of the drug" (chloroform) "which would secure an adequate anaesthesia for operations and at the same time not endanger life."

The object of the original reference was to obtain accurate data for the examination of the methods in use and to promote others whereby chloroform could be quantitatively recovered from the air respired as well as from the fluids and tissues of the body. This being done, it would be possible to determine the actual dose given and the amount of the drug in the body which induced anaesthesia, and that which produced the deeper narcosis culminating in failure of tissue life, respiratory failure, and circulatory collapse.

The importance of anaesthetics as ancillary to surgical practice has always been accepted, but although much scientific work has been done from the times of Snow, of the issue of the Glasgow Chloroform Report of the British Medical Association and of Paul Bert down to the publication of the Hyderabad Commissions, and of the various other reports to which they led, no permanent lessening in the number of fatalities has resulted. Most of the reports have been couched in technical language and have not been accepted by the bulk of the profession as possessing a practical as well as an academic side. The discussion as to whether a patient dies through failure of the heart or as a result of respiratory syncope, when isolated from practical considerations of the best methods of preventing all fatalities, has not appealed to busy practitioners. The scientific methods proposed by Snow, Bert, Clover and others fell into desuetude and most teachers adopted the methods of giving ether from closed inhalers with little regard to the quantity the patient inhaled, and of giving chloroform either by a *guttatim* method on an open mask or surface, or by a semiclosed plan of pouring a drachm of the anaesthetic into a Rendle's mask or Hyderabad cone held over the patient's face. The rule in the latter case was to watch for symptoms of danger, and, when such occurred, to remove the chloroform mask. Possibly in the most skilled hands this method gave fairly good results, but such results could only be assured when *all* the conditions were favourable, as no danger was suspected or warning given until the physiological effects of the overdose made themselves evident. The actual quantity given, and the actual strength of the vapour inhaled, were not accurately known, and were only guessed at by the results seen in the patient. Obviously, however, chloroform, *like all other drugs, must possess its dose*—such a dose would give a

[3] BRITISH MEDICAL JOURNAL, July 20th, 1901, p. 168.

[4] By a minute of Council, 5173.

[5] The personnel of the Special Chloroform Committee underwent several changes subsequently. Professor Waller, after acting as Chairman for some time, retired and was succeeded by the late Dr. H. Radcliffe Crocker, while Professor Brodie, F.R.S., Professor C. J. Martin, F.R.S., Professor Sherrington, F.R.S., Dr. McCardie (Birmingham), and Mr. G. Rowell were elected members. The Committee at the end of its work consisted of: Sir James Barr, M.D.; Professor J. G. Brodie, F.R.S. (but owing to his absence from England Professor Brodie was obliged to cease active co-operation); Dr. Dudley Buxton (Honorary Secretary); Professor Dunstan, F.R.S.; A. Vernon Harcourt, F.R.S.; Sir Victor Horsley, F.R.S. (Treasurer); Dr. McCardie; Professor C. J. Martin, F.R.S.; Professor Sherrington F.R.S.; G. Rowell, F.R.C.S.

definite strength of vapour in air, as well as a definite amount circulating in the organism, and would produce definite effects thereon. These will produce the results aimed at—in the first place, induction of unconsciousness, and, in the second, maintenance of this state. These must be constant, with possible variations in individuals, or under unusual conditions. To give more than the requisite strength of vapour during inhalation, or to allow more than the requisite amount of chloroform to enter and circulate in the tissues of the organism, must lead to further physiological effects than those grouped in the state called "anaesthesia." Experience and experiment prove such to be the case. When anaesthesia is exceeded, failure of the necessary machinery of life, respiration and circulation, ensues, and systemic death ultimately occurs.

When an unknown strength of vapour and an unknown quantity in the circulation are employed no scientific method can be pursued and no true safeguard can be imposed upon the employment of chloroform. Watching symptoms only is at best an unscientific plan and only justifiable when the experimentalist possesses no absolute knowledge of the drug he is using or of the effects it, in its minimal and maximal doses, will provoke.

Dr Waller in his letter to the Council of the British Medical Association referred to the various inquiries which have been made to elucidate the action of anaesthetics and to determine the means, if any, which might be found to prevent fatal accidents under these agents. The question is one of the first importance and involves not only professional but public interests, since if some deaths are preventable they are, as Dr. Waller says, "unjustifiable." The public has every right to demand that the subject should be dealt with on wide lines and conclusions arrived at which should dominate medical practice in the use of anaesthetics.

One of the first inquiries was that initiated by the Royal Medical and Chirurgical Society (now the Royal Society of Medicine) and published in their *Transactions* in 1864.[1]

The Committee investigated the physiological action of chloroform and ether, and arrived at the conclusion that the danger of the former arose from its use in concentrated vapour. The value of Mr. Clover's inhaler was admitted, but its use was limited by its intricacy and nonportability. Dr. Harley's method of dilution was also commended, chloroform being diluted as follows:

Mixture A.

Alcohol	...	...	1 part (sp. gr. .838)
Chloroform	...	...	2 parts (sp. gr. .735)
Ether...	...	...	3 parts (sp. gr. .149)

Mixture B.

Chloroform	...	...	...	1 part
Ether ...	...	...	...	4 parts

Mixture C.

Chloroform	...	...	...	1 part
Ether ...	...	...	...	2 parts

Valuable as is this report, yet it failed to supply any definite data concerning the actual percentages of chloroform vapour which correspond respectively to safety or danger, although in the rules relating to the administration of chloroform which are drawn up it is stated:

> Three and a half per cent. is the average amount and 4½ per cent., with 95½ per cent. of atmospheric air is the maximum of the anaesthetic which can be required, given cautiously at first, the quantity within this limit should be slowly increased according to the necessities of the case, the administrator being guided more by its effect on the patient than by the amount exhibited.

In 1877 the British Medical Association inaugurated their public-spirited policy of devoting large sums of money to the thorough investigation of the questions involved in the use of anaesthetics. At the Annual General Meeting held that year in Manchester a committee was appointed to investigate: (1) Wherein lies the special danger of chloroform, and (2) to try and discover if any anaesthetic existed whose use would avoid these dangers.[2]

The members of the Committee were Dr. Joseph Coats, William Ramsay, Ph.D. (now Sir William Ramsay, K.C.B.), Professor J. G. McKendrick. Dr. David Newman replaced Sir William Ramsay when the latter left Glasgow. This report contains a large amount of careful physiological research, and gives the pharmacology of many of the agents which from time to time have been employed as anaesthetics. The specific question of dosage by chloroform was not dealt with, and the Committee's findings therefore do not enter into the purview of the present report. One important part of that Committee's work—that dealing with the effects produced by anaesthetics upon the gases of the blood—was unfortunately not completed.

The British Medical Association granted, further, money for the prosecution of a research (1888) upon the action of anaesthetics to Professor McWilliam, whose reports have been published in the BRITISH MEDICAL JOURNAL (1890, ii, pp. 831 and 948). In his twenty-third conclusion he says:

> Free dilution of chloroform with air—the restriction of the percentage of chloroform vapour to 4 or 4½ per cent.—gives no security against an overdose. A percentage that gives safe anaesthesia during ordinary breathing may lead to fatal collapse if given during exaggerated respiration.

Professor McWilliam's conclusions are dealt with later in the present report.

In 1888 the Hyderabad Commission published its first report, and subsequently the second Hyderabad Commission Report and the Clinical Report undertaken through the enterprise of the *Lancet* were published in a volume.[3] This contained also the tracings obtained during the laborious physiological investigations undertaken under the direction of Lieutenant-Colonel Lawrie, M.B., at the charges of the Nizam of Hyderabad.

The conclusions arrived at in these reports have been much criticized, but they possess great value, although unfortunately they did not touch directly upon the dosage question.

Various further reports arising out of the controversy which followed were presented by Drs. Gaskell, Shore, Hare and Thornton, and others, but these also bore upon the physiological action of chloroform, and not upon the question of its use in vapours of definite percentage value.

In 1891 the Council of the British Medical Association appointed a committee with the following reference:

> To investigate the clinical evidence with regard to the effects of anaesthetics upon the human subject; and especially the relative safety of the various anaesthetics, the best methods of administering them, and the best methods of restoring a patient in case of threatened death.[4]

The Executive Committee which drew up the report was composed of Mr. Teale (chairman), Dr. Dudley Buxton (vice-chairman), Mr. (now Sir Jonathan) Hutchinson (*ex officio*), Professor Chiene, the late Mr. G Eastes, Dr. Hewitt, Mr. David Wallace, Dr. Childs (honorary secretary), and Mr. Rowell (honorary assistant secretary). Sir William Ramsay, K.C.B., and Lieutenant Colonel Laurie contributed reports, which were published by the Association in 1900 as appendices to the main report. This dealt with forty-five methods of using the usual anaesthetics. In the conclusions at which the committee arrived (p. 124) it is stated:

> No method of administration of chloroform is free from danger, but an examination of the communicated cases appears to show that the occurrence of danger depends largely upon the administrator who employs any particular method.

No evidence appears to have been tendered to the committee bearing upon the question of safety when chloroform is used in vapours of definite percentage value.

The next step taken by the British Medical Association was the appointment of the Special Chloroform Committee (1901), of which the present volume is the final report.

As is indicated by the wording of the extended reference (see p. 47), the scope of the Committee's work included, if it did not mainly consist in, an effort to promote such knowledge concerning methods for administering chloroform as would tend to lessen the number of "preventable" deaths under that anaesthetic.

[1] The Committee consisted of: T. B. Curling (Chairman), Thomas Bryant, Saml. Cartwright, Arthur Farre, George G. Gascoyne, George Harley, Prescott Hewett, F. W. Mackenzie, William Marcet, Charles H. Moore, James Paget, William O. Priestley, Richard Quain, Francis Sibson, R. Dundas Thomas, Charles West; Septimus W. Sibley and George W. Callender being reporters, and John Birkett Honorary Secretary. Mr. Clover assisted although not on the Committee.

[2] BRITISH MEDICAL JOURNAL, 1880, vol. ii, pp. 957 and 984, gives a full report of the work of this Committee, and includes the three preceding reports. See BRITISH MEDICAL JOURNAL, 1879, vol. i, pp. 1, 708, 921.

[3] *The "Lancet" and Hyderabad Commissions on Chloroform.* London: The *Lancet* Office, Strand. 1893, pp. 193.

[4] BRITISH MEDICAL JOURNAL, 1891, vol. ii, pp. 1088 and 1329.

It was felt by the Committee that the principal reason of the large number of deaths which every year occur, either directly through the inhalation of chloroform or indirectly during its employment, was to be sought in the methods used for inducing anaesthesia by that drug. Inasmuch as no method of administering chloroform by known doses was in use, fatalities had occurred in practice during the employment of unknown quantities of chloroform. Further, the strength of chloroform in the air breathed varies within wide limits during both the induction and maintenance of anaesthesia. One school of thought advocated large quantities of chloroform with free access of air; another insisted upon drop doses which evaporate near the entrances of the air passages. Certain inhalers—Snow's, Bert's, Clover's, Dubois's, Junker's—were promoted to give more definite quantities of chloroform vapour in air. Of these only Junker's at present is used at all largely, and its capability of delivering definite percentages depends, as in the open or semi-open methods, entirely upon the acumen and skill of the person controlling the air supply. The rules which have guided, and are still laid down in most of the manuals as guiding, students in the use of these methods are summed up in the instructions: (1) Watch the respiration, (2) cease to give chloroform when respiration is obviously interfered with.

As an unknown quantity of chloroform has entered the lungs, and as its effect upon respiration cannot be evinced until it has entered the blood stream and actually produced its effects upon the nervous tissue which innervates all function, no chloroformist can tell whether the dose given is fatal or not.[1] It may be said that the expert administrator can and does notice the most trivial changes in respiration, and so safeguards his patient. As even the most skilful men, like Snow and Clover, met with deaths, it is evident that the prevailing methods are not safe. Further, it is the general practitioner or young house-surgeon who is called upon most frequently to give chloroform, and therefore it is imperative that the problem of safe chloroform-giving should be solved as far as possible, both in the interests of the general public and of the medical profession at large.

In order to learn what effects known percentages of chloroform vapour in air when inhaled will produce upon the body as a whole, it is necessary that we should express the strength of the mixture of air and chloroform offered to the blood and tissues in terms of percentages of vapour inhaled.

The Committee had, therefore, first to ascertain the most reliable methods of estimating chloroform (*a*) in air, (*b*) in liquids, (*c*) in the bodies of animals variously anaesthetized.

A very considerable time was spent in this investigation, which was carried out partly in London, partly in Paris, and partly in Oxford—Professor Dunstan, Mr. A. Vernon Harcourt, and Professor A. D. Waller undertaking the physico-chemical parts of the research. Dr. Tissot assisted in France, and various workers in England. Their results appear in the appendixes of the Reports.

Having assured themselves of the substantial accuracy of the previous workers, who affirmed that chloroform acts directly according to the strength of the vapour inhaled, and ultimately according to the quantity in circulation, the Committee sought for a method capable of controlling the percentage strength of vapour. Their results are given in detail later on; but it may be said here that (*a*) any drop method was excluded, since the minim value varies within wide limits according to the dropper employed; evaporation, which determines the percentage value of the vapour inhaled, varies according to the nature and closeness of structure of the fabric upon which the chloroform is dropped, and with the rapidity of dropping as well as the area of fabric which is moistened; evaporation also varies with the temperature of the liquid, that is, of the drop bottle held in the hand, and the temperature of the air in the room, as well as the vigour of the patient's respirations. (*b*) Any method of dilution such as the alcohol, chloroform, ether, chloroform and ether, or Schleich's (chloroform, ether, and "petroleum ether") mixtures, fails to give accurate percentage vapour values for the chloroform as inhaled, since their rate of evaporation is uncertain, being conditioned by circumstances outside the control of the administrator.

Dr. Waller also placed at the disposal of the Committee the work which he with the assistance of Dr. Dodgson had prosecuted at St. Mary's Hospital Physiological laboratory, by aid of a grant from the British Medical Association.[2]

The methods of quantitative estimation hitherto employed are set out in chronological order as follows:

1. That of Lallemand, Perrin, and Duroy, 1850.
2. That of Schmiedeberg, 1867 (modified under his direction by Pohl, 1891).
3. That of Gréhant and Quinquant, 1883.
4. That of Chancel and Parmentier, 1885.

In principle the method of the French observers consists in the decomposition of chloroform by a strong solution of potash and subsequent volumetric estimation of chlorine in the resultant potassium chloride.

This procedure is directly applicable to an aqueous solution of chloroform, and can be applied to a mixture of chloroform and air, the gas being first brought into aqueous solution by shaking with a sufficient volume of chloride-free water. In the case of blood and tissues, the chloroform present is first distilled off *in vacuo* and a chloride estimation made as before in the distillate. Gréhant estimated chloroform in the distillate by the reducing power upon Fehling's solution.

In the German method of estimation the chloroform present in a fluid or tissue is distilled off and slowly aspirated through a combustion tube filled with calcium or preferably magnesium oxide, and the resultant chloride estimated as before by nitrate of silver solution. This method is also applicable to the quantitative estimation of chloroform in air, a known volume of the gaseous mixture being slowly driven through the combustion tube by mercury displacement.

After trial of all these various methods with known weights of chloroform in water, in blood, and in small animals, the following procedure was adopted as giving the most trustworthy results as regards the quantitation of chloroform in small animals and organs of large animals:

APPARATUS AND METHOD.

A.—*Distillation and Combustion.*

A glass vessel is used with two-way Drechsel stopper to contain the distilland (water, blood, organ, or small animal) and placed in a water bath. The inlet and outlet tubes are connected respectively with a wash-bottle and a froth-chamber. The volatile products of distillation are slowly drawn through a combustion tube by means of the aspirator. The combustion tube, 80 cm. long and 14 mm. in diameter, is filled with granulated magnesium oxide (previously washed until chloride free), and kept at red heat in an ordinary gas furnace. Two wash bottles containing respectively potash and nitrate of silver placed between the combustion tube and aspirator, serve to stop and to indicate any possible escape of hydrochloric acid through the combustion tube. It was found that no such escape occurred, however; the rate of aspiration was maintained at about 60 bubbles per minute.

Estimations were also made without heat in the cases of chloroform in water and chloroform in blood—in the latter case for the sake of avoiding coagulation of proteids—air being slowly aspirated through the solution at ordinary temperature. In this case a longer duration of experiment was necessary than when heat was employed. The two ends of the combustion tube were bent at a right angle, and connected with the other parts of apparatus by mercury joints at the two ends.

The duration of a distillation was generally four to six hours, at the end of which time the chloride present in the combustion tube was titrated, and from this result the amount of chloroform in the distilland calculated.

B.—*The Estimation of Chloride.*

This was conducted as follows:—The combustion tube when cooled was turned up and filled with 30 per cent. nitric acid. The solution when complete is transferred to a beaker; the tube is washed out with a known volume of distilled water. The titration of chloride is carried out with nitrate of silver and sulphocyanide of ammonium with iron alum as the indicator (Volhardt's process). By preliminary trial the error of this stage of the process was determined to be + 0.0001 gram chloride.

Other methods were examined, among which may be noted that suggested by Dr. Waller, based upon the absorption of chloroform vapour in air by means of olive oil. Dr. Waller's paper describing this, and Professor Dunstan's report, are given in the appendix.[3] (First Report, pp. 17–23.)

Mr. Vernon Harcourt's method[4] of estimating chloroform in a current of air, and chloroform by passing it through a tube heated by an incandescent platinum wire is described in a paper by him in the appendix. (First Report, p. 12.)

The methods of quantitative estimation of chloroform in water, in air, in blood, having been thus tested, the

[1] This fact itself offers a strong argument against the value and importance of verdicts obtained in coroners' courts after inquests held on cases of deaths occurring during anaesthesia. See the evidence given by the British Medical Association before the Departmental Committee appointed to inquire into the law relating to coroners and coroners' inquests.

[2] BRITISH MEDICAL JOURNAL, July 12th, 1902, p. 118 et seq.

[3] See also BRITISH MEDICAL JOURNAL, July 12th, 1902, p. 124.

[4] Ibid., p. 121.

Committee adopted those of Mr. Vernon Harcourt and Dr. Waller and employed them, first, to determine the amount in blood, etc., and later to estimate the chloroform which entered the lungs during inspiration and left during expiration. With the selection and amplification of these methods ended the first part of the Committee's work. It next undertook an examination of the various apparatus employed to give chloroform in accurate percentages in air, in order to arrive at what is the minimum dose of the drug which will produce adequate anaesthesia for operations and at the same time not endanger life. These apparatuses are described and criticized in a later section (p. 63).

It was decided to use the Vernon Harcourt model, and a large number of patients were chloroformed by it. The chloroform in the inspired and expired air was estimated, and a 2 per cent. mixture adopted as the minimum requisite for induction; a lower percentage was found to be sufficient to maintain anaesthesia. These proportions of chloroform and air varied with the length of time during which the patient inhaled and with his physical development. Blood estimates also were made from animals to which definite percentages of chloroform were given. Very complete experiments were made by Professor Sherrington and Miss Sowton, with a view of ascertaining the effects of definite percentages of chloroform upon the isolated heart, circulation, and so on, and the results at which the workers arrived are given in the section on the Physiological Action of Chloroform.

The effects of chloroform upon respiration and the relation between the amount inhaled and exhaled were studied and reported upon by Professor Brodie and Miss Widdows, and by Mr. Vernon Harcourt. Sir Victor Horsley, with Mr. Harcourt, reported upon the part played by the constituents of the blood, and especially the red corpuscles, in retaining chloroform when brought into contact with blood. The examination was undertaken of inhalers employed in giving exact doses of chloroform and the effects noted clinically. Such doses upon patients were studied. It should be noted that in the earlier stages of their inquiry the Committee had the advantage of Dr. Waller's advice and experience; during this time he sat as Chairman of the Committee and directed much of the work.

SECTION II.

PHYSIOLOGICAL PROCESSES OF ANAESTHESIA.

Synopsis of the Action of Chloroform upon the Tissues of the Body.

INTRODUCTORY.

The following brief summary of the physiological action of chloroform upon the different tissues and mechanisms of the body is based primarily upon the experiments performed on behalf of the Committee, but for the sake of greater completeness the work of others has been freely drawn upon.

By the reference to the Committee they were particularly concerned with the effect of chloroform as administered in different strengths, and therefore especial emphasis is given to experimental results in which the percentage of $CHCl_3$ in the air administered has been ascertained, while in the case of isolated organs and tissues the quantity of $CHCl_3$ in the fluids with which they were supplied has been known.

In the case of the intact animal this has been accomplished by some reliable arrangement for mixing chloroform vapour with air so as to supply a variable but known percentage of the former.

The mixture enters the air passages either through the mouth and nose, in which case a dead space is introduced (to this reference will be made latter), or directly through a tracheal tube in the case of the lower animals, and in man, when a preliminary tracheotomy has been required. The mixture having entered the lungs becomes commingled with the residual air, and rapidly diffuses into the pulmonary alveoli. The passage of the chloroform through the walls of the alveoli and its assumption by the blood follows. What constituents of the blood are operative in this connexion constitutes not only an important question in the physiological inquiry but presses for answer when we have to face the behaviour of chloroform towards pathological states of the blood—for example, anaemia, toxaemia. The chloroform is conveyed by the blood stream to the tissues, whose constituent cells absorb it in varying amount according to their chemical composition. The actual effect upon individual tissues exerted by chloroform in different concentration constitutes the ultimate basis of the problem.

Whilst chloroform acts as a general protoplasmic poison, different tissues vary greatly in their sensibility to the drug and different portions of the same tissue—for example, different groups of nerve cells exhibit varying degrees of susceptibility to its action. It is entirely due to this individual peculiarity of cell mechanisms to chloroform action that it can be employed as an anaesthetic. By arranging the dose of chloroform in the blood the essential mechanisms of circulation and respiration may be maintained at a sufficient degree of efficiency, whilst the functional activity of much of the nervous system is in abeyance.

The working margin between a concentration of chloroform which will permit of entire suspension of function of one group of cells and not influence essential mechanisms to a dangerous extent is not a large one, and it is precisely with a view to ascertain what this margin is that much of the experimental work of the Committee has been undertaken.

Effects Produced by Strong Chloroform Vapour on the Upper Air Passages.

As the chloroform vapour and air enter the upper air passages strong vapours—that is, over 2 per cent.—have been shown (Brown Séquard) to excite laryngeal spasm, and it has been demonstrated further that they excite reflex inhibition of the heart and through the superior laryngeal nerve reflexly affect the respiratory centre. It is desirable, therefore, to commence the inhalation, especially in the case of children whose mucous membrane is very sensitive, with a 0.2 per cent., and in the case of adults, with a 0.5 per cent. mixture. The irritability of the upper air passages is usually lessened or lost in a minute, and the dosage can then be increased to 0.5 per cent. and 1 per cent. in the respective cases.

Chloroform also produces salivation, especially in certain diseases, for example, goitre, and interference with breathing from this cause often occurs.

THE CHLOROFORM TENSION IN THE INSPIRED ALVEOLAR AND EXPIRED AIR.

Preliminary Considerations.

The average amount of air inspired with each breath is somewhat less than 500 c cm. This amount is drawn into the lungs and air passages which already contain upwards of 3000 c cm. Take the case in which $CHCl_3$ is being administered by means of an inhaler which delivers 1 per cent. of the vapour: 500 c.cm. of air containing this strength is drawn into the lungs, but a considerable proportion is required to fill the trachea, bronchi, and upper air passages. The chloroform diffuses throughout the whole quantity of air in the lungs, but the interval between the respirations is insufficient to permit of equilibrium being attained. Nor would equilibrium occur if the interval were longer, because $CHCl_3$ is all the time being absorbed from the alveoli so that a steady grade of tension of vapour from the upper air passages where it is highest to the alveoli where it is lowest results.

A number of observations upon the chloroform tension in the inspired and expired air during the administration of the anaesthetic to man and animals have been made for the Committee and are published in the appendices. (See papers by V. Harcourt and Brodie and Widdows in Fifth Report, BRITISH MEDICAL JOURNAL, ii, 1906.)

"The Dead Space."

Of the 450 to 500 c.cm. of air inspired during an ordinary respiration about 150 c.cm. does not reach the alveoli, as it is required to fill the air passages. This constitutes the respiratory "dead space."

A further increase in dead space cannot be avoided when a mask connected with a draw-over inhaler is used.

The dead space between the lips and walls of the mask may be taken as about 130 c.cm., and the dead space within the body between the lips and the lungs as 150 c.cm., giving a total of 280 c.cm. The volume of

expired air is usually about twice as much as this, and therefore at the end of an expiration the dead space contains air which has been in contact with the lungs. With the ensuing inspiration this air is drawn into the lungs again, together with a similar quantity of air containing chloroform vapour.

The same air now fills the dead space, and forms the first portion of the air which on expiration passes through the expiration valve, the second portion only being air which has entered the lungs.[1]

From the figures mentioned above it follows that if diffusion equilibrium were attained, and no $CHCl_3$ absorbed into the blood, the tension in the alveolar air at the end of the first respiration would be 0.14 per cent. Neither of these conditions is, however, fulfilled, and the percentage of chloroform in the alveoli at the end of the first inspiration must be considerably less than 0.1 per cent.

With succeeding respirations it will slowly but progressively rise, because each successive 500 c.cm. of air and vapour drawn into the lungs mixes with or diffuses into alveolar air containing chloroform in increasing amounts.

The results show some irregularities which are no doubt due to variations in the depth and rate of respiration at the time of taking the samples. When examined together they permit of the conclusion that when 1 to 2 per cent. vapour is administered an amount varying from one-half to one-third as the administration continues is retained. It follows from these facts that in the ordinary administration of $CHCl_3$ for surgical purposes the tissues do not become charged with $CHCl_3$ to an extent corresponding to the amount of $CHCl_3$ in the air. Collingwood has, however, administered 1.3 per cent. $CHCl_3$ to cats until the amount contained in the expired was equal to that in the inspired air. The time required was fifty to eighty minutes. In the experiments the dead space was reduced to a minimum by attaching a tube with inlet and outlet valves directly to the trachea.

In the case of man with the greater mass of tissues to be charged with the $CHCl_3$ in proportion to the respiratory surface, and the added dead space of the upper air passages and inhaler the time required to arrive at equilibrium with the tension of chloroform in the inspired air would be much longer. If during the progress of anaesthesia the amount in the inspired air is considerably lowered, the proportion retained diminishes.

Assumption of Chloroform by Blood and its Absorption by the Tissues.

Solubility of Chloroform in Blood.

To determine the solubility of chloroform in blood the method was adopted which is fully described in the Committee's first report, Paper IIA, by A. Vernon Harcourt,[2] in which air and chloroform were led through blood at 37° C. The chloroform was extracted and determined and air passed through while the temperature was gradually raised to 90° C. The full determination gives the weight of chloroform dissolved in 100 c.cm. of blood at 37° C., and at a pressure of 21.5 mm., as 0.071 gram, or 0.71 per litre. In order to ascertain the blood content of chloroform when the anaesthetic enters the blood after being inhaled and to investigate the question in which of the constituents of the blood the chloroform was retained, other methods were sought. Mr. J. H. Wells, whose early death is deeply regretted by those with whom he worked, was the assistant appointed by the Committee and worked under Dr. Waller.[3] He conducted experiments upon the extraction of chloroform from blood by the French method (extraction *in vacuo* followed by digestion with alcoholic potash and titration of chlorides), and found a fundamental difference between blood and simple salt solution or water as regards their absorptive power towards chloroform vapour.

The Committee's report states:

The inference from these two data (that blood absorbs more chloroform, that blood delivers less chloroform than water under extraction[4]) is that blood possesses greater affinity for chloroform than does water, and that therefore in the transfer of chloroform by blood from the pulmonary air to the nerve centres, that fluid does not act as a simple solvent but rather as a temporary retaining and restraining medium, that helps to convert irregular into constant flow.

The Constituents of the Blood with which the Chloroform is Associated.

The bulk of the $CHCl_3$ contained in blood appears to be loosely combined with the corpuscles.

Pohl[5] estimated that the red corpuscles hold from 87 per cent. to 90 per cent. of the chloroform in the total blood; Nicloux's[6] figures are somewhat below these results, while G. A. Buckmaster and J. A. Gardner[7] accept Pohl's estimate as probably correct, and as corresponding with the results to which their experiments have led them.

The experiments of Waller and Wells were confirmed and extended by Moore and Roaf. Moore and Roaf estimated vapour pressures of chloroform in water, serum, and haemoglobin solutions, the latter being equivalent to the strength of that proteid in the blood. Their results show that the absorption of chloroform by these protein solutions does not obey the Dalton Henry law, but that it enters into aggregation with the proteids. In water it obeys this physical law. They have also shown, for a given content of chloroform in the mass investigated, that the vapour pressure of chloroform in water or saline always exceeds that which is found for haemoglobin or an emulsion of serum. They therefore conclude that the chloroform is associated with the proteins of the blood in some sort of loose, reversible combination.

Further experiments upon the content of chloroform in blood were made by the Committee.[8] Solutions of urea were added to blood containing chloroform to keep it liquid, and as a test experiment proved that 99.9 per cent. of chloroform could be recovered the method was employed to estimate the amount of chloroform in the blood of animals inhaling that anaesthetic. It was found that such blood remained unchanged for three or four days. Having thus obtained correct results in estimating the percentage of chloroform in the blood it became possible to attempt to ascertain with which of the constituents of the blood the chloroform was associated. After centrifugalizing the resulting plasma clotted slightly, the clear serum and unclotted plasma were separated, and after adding urea solution with known quantities of chloroform the two portions were examined. The whole of the chloroform was extracted from the serum plasma, but only 79.71 per cent. from the corpuscles and clot mixture. To determine whether the clot or the corpuscular part retained the chloroform specimens were taken and some were laked before adding chloroform. In all these the recovery of the added chloroform was complete; in others in which the charge of chloroform was received before the laking process the recovery of the added chloroform was incomplete. The inference from these facts may justly be that the retaining power of the blood is also associated in some degree with the integrity of the corpuscles at the time of the entry of the chloroform into the blood, and this bears directly on all methods of estimating chloroform in blood. Further actual examination by these methods of blood taken from an animal chloroformed by means of an accurate percentage method showed that the percentage of chloroform in the blood during adequate anaesthesia was found to correspond very nearly with the observations made earlier by Pohl, but in the case of the experiments carried out for the Committee the fatal dose was not twice the amount required to produce unconsciousness to pain.

Gases of the Blood during Chloroform Anaesthesia.

The association of chloroform with the components of the blood—the aggregation of Moore and Roaf—is certainly not a firm one, and the red corpuscles readily pass on the associated chloroform to the tissues, provided the tissue chloroform tension is below that present in the corpuscles. This association, or aggregation, appears to superinduce no permanent change in the blood itself. The theory once held that the state called anaesthesia was due to deoxidation of the blood and tissues is disproved by Tissot's experiments.[9] The changes in the proportion of the gases

[1] Vernon Harcourt, BRITISH MEDICAL JOURNAL, ii, 1906, p. 85.
[2] BRITISH MEDICAL JOURNAL, July 12th, 1902.
[3] See *Proc. Roy. Soc.*, vol. lxxiv, 1905. Paper by Dr. A. D. Waller, "On the Physical Relation of Chloroform to Blood," pp. 55-59.
[4] The figures given by Mr. Harcourt in his paper are: Water, 0.54 gram per litre; blood, 0.71 gram per litre. (See First Report Appendix, p. 16.)
[5] *Arch. f. exp. Path. u. Pharmak.*, vol. xxviii, 1890-1.
[6] *Comptes rendus*, 1906.
[7] *Proc. Roy. Soc.*, Series B, vol. lxxviii, 1906.
[8] Third Report, Appendix III, D. B. Byles, A. Vernon Harcourt, and Victor Horsley, BRITISH MEDICAL JOURNAL, July 23rd, 1904.
[9] See Committee's First Report, July 12th, 1902, pp. 31 and 32.

of the blood in a person under chloroform, if any, are due entirely to variations in the thoracic movements and the volume of the respiration. As the respiratory movements nearly always decrease both in frequency and amplitude, a corresponding decrease in the amount of oxygen in the blood is nearly always observed. At the moment of the cessation of respiration the blood becomes deprived of almost all its oxygen, and to a degree even more pronounced than is the case in ordinary asphyxia through want of oxygen. The carbonic acid gas present usually varies inversely as the oxygen. It is lessened by polypnoea, increased by feeble lung ventilation. During chloroform narcosis the blood retains up to the time of death its normal power of taking up oxygen. If the amount of this gas (oxygen) diminishes in the blood, the decrease is solely due to the slowing of the rhythm of respiration.

Dr. Tissot's results are given in the table at the foot of this page.

The general conclusions which may be drawn from the observations briefly reviewed above are: (1) That blood takes up about three and a half times as much chloroform as water under the same conditions as regards temperature and pressure. (2) That it exists for some part in combination with the proteins of serum and haemoglobin. (3) That these combinations are reversible, and the chloroform is given up again when the pressure of chloroform is decreased.

Evidence pointing to a Reversible Combination between Chloroform and the Proteins of the Tissues.

Moore and Roaf have extended their observations[1] showing that $CHCl_3$ forms a loose combination with haemoglobin and serum proteins to the constituents of some tissues. They used emulsions of heart, liver, and brain cells, to which a definite amount of $CHCl_3$ in saline was added, and compared the vapour pressure developed with that of the saline alone after the addition of a similar quantity of $CHCl_3$. The results obtained were analogous to those they obtained with serum and mentioned above. Parallel observations with the ethereal extracts of serum and brain showed that only a small proportion of the combined $CHCl_3$ was dissolved in the lipoids. Further, it must be remembered, as is pointed out by Moore and Roaf, that with regard to any theory of anaesthesia based upon the high content in cholesterin, lecithin, and fatty derivatives soluble in ether of the nerve cell and its processes for chloroform, these substances are not demonstrably present in any quantity in by far the greater number of animal and vegetable cells, and yet such cells are readily affected by anaesthetics.

These observers believe that their experiments justify the conclusion that chloroform forms an unstable chemical compound or physical aggregation with the proteids experimented on, and that it is carried in the blood in such a state of combination. Since proteids build up the protoplasm of living cells, it appears probable that chloroform and other anaesthetics must form similar combinations with protoplasm, and that anaesthesia is due to the formation of such compounds which limit the chemical activities of the protoplasm. These compounds are unstable, and dissociate when the chloroform tension is lowered. The effect of the aggregations is to render the protoplasm of all tissues less able to perform its function. It is, during the continuance of the effect, paresed. Moore and Roaf are led to believe that the effect of anaesthetics upon the protoplasm of such tissues as those which compose the heart, the nervous system, voluntary muscles, and so on, is directly proportional to the tension of chloroform; in other words, to its concentration or osmotic pressure.

[1] *Proceedings of the Royal Society*, November, 1905.

DISTRIBUTION OF CHLOROFORM IN THE TISSUES.

The investigations[2] of Lallemand, Perrin, and Duroy are a source from which several important data have become (and have remained) current in the literature of anaesthetics. They make the important statement that in the bodies of animals killed by chloroform the anaesthetic is not equally distributed to all kinds of tissue, the proportions of chloroform found in one of their experiments was—

In the brain ...	...	3.92 c.cm. per 100 grams.
In the liver ...	...	2.08 ,, ,,
In the blood ...	...	1.00 ,, ,,
In the muscle	...	0.16 ,, ,,

The principle of unequal distribution is probably accurate, but the figures cited cannot be accepted as accurate, since the methods pursued were obviously defective. The theory advanced by Hans Meyer and Overton, working independently, to explain anaesthesia may be thus described:

Chloroform and other anaesthetics are absorbed by the lipoids, bodies in which the cell constituents of the nervous system are extremely rich.

This they regard as explaining the rapidity with which chloroform acts upon and pareses the nervous system.

Examination of the following sections will indicate that the cells of the various structures of the body behave differently in degree though not in kind towards chloroform. The most sensitive is the nerve cell; the muscle of the intestine is the least.

ELIMINATION.

We have now traced the entrance of air impregnated with chloroform into the lungs, its absorption by the circulating blood, and conveyance by blood corpuscles to the tissues, first to the heart and blood vessels, then to the skeletal and other muscles, the nervous structures and glands. It has been shown that taken in their isolated state each of these tissues shows effects produced by chloroform which are directly proportional to the chloroform tension in the circulating fluid. As soon as the tissue which has a lower chloroform tension is brought into relation with a fluid with a higher chloroform tension it takes up chloroform until its content or tension equals that of the circulating fluid. On the other hand, when the tissues possess a higher chloroform tension than that of the blood they part with an aliquot portion of the chloroform, which is conveyed away by the lymph and venous blood to the lungs, where if the tension of $CHCl_3$ in the alveolar air is less than that in the blood, $CHCl_3$ passes out. It will be evident that under normal conditions the order of events is, first, the tissues acquire chloroform from the blood, and when the amounts taken and that given off are equal equilibrium exists. It is a safe equilibrial state which is to be aimed at, on one side of which lies lessened narcosis, on the other deeper narcosis. If the definite percentages of chloroform which correspond with safe production of anaesthesia with a dangerous degree of narcosis respectively, are known and can be accurately produced and controlled, the problem of finding a safe method of inducing and maintaining anaesthesia by

[2] First Report, 1902, July 12th, BRITISH MEDICAL JOURNAL.

Proportion of Gases in 100 c.cm. of Arterial Blood.

Blood in the Order of Removal.	Total Volume of Gases.	Carbonic Acid.	Oxygen.	Nitrogen.	Remarks.
	c.cm.	c.cm.	c.cm.	c cm.	
1	50.13	26.85	21.65	1 60	Normal blood before anaesthesia.
2	43.55	21 15	20.80	1 60	Blood removed during apparently normal respiration.
3	46.21	25 06	18.10	2 05	,, ,, ,, ,, ,,
4	46 90	32.80	12 41	1.69	During a respiratory arrest of 20 seconds.
5	55 41	39.30	14.24	1.87	At the commencement of a respiratory arrest of one minute.
6	44 20	42 20	0.78	1.22	Ten seconds after commencement of final cessation of respiration, the heart s beating

chloroform has been solved. This the Committee believe is now possible by the dosimetric method—that is, percentage administration.

EFFECT OF CHLOROFORM UPON THE HEART AND CIRCULATION.

It is not proposed to recapitulate the theories which have been made a fighting ground for the adherents of various schools of thought with regard to the effect of chloroform upon the heart.

The weight of physiological and clinical evidence appears to support the view that whatever may be the actual order of events occurring when death from chloroform poisoning takes place, the heart is profoundly influenced by that anaesthetic. If chloroform does not cause death through a primary effect upon the heart's structure, there is every reason to believe that the heart's vital resistance is so lessened by chloroform as to prevent its withstanding the strain incident to intercurrent asphyxia, shock, or vagal inhibition. For the purpose of this report it is unnecessary to pass in review much of the work which has been done upon this subject. The problem the Committee have attempted to solve is, "What are the effects upon the isolated mammalian heart of known concentrations of chloroform, and what are the effects of such concentrations upon the heart of the intact animal?" The blood, which, as we have seen, has aggregated a certain amount of chloroform in the serum and red corpuscles, passes very rapidly from the pulmonary vessels to the heart. The first important vessels to be entered are the coronary system supplying the cardiac muscle, so the brunt of the effect of the chloroform in the blood stream must fall upon the tissues of the heart. But little, if any, of the chloroform passing in the blood stream from the lungs will have been absorbed or dissipated before the blood enters the myocardium. Professor C. S. Sherrington and Miss S. C. Sowton[1] have shown that the isolated mammalian heart reacts towards chloroform in the following manner: When the anaesthetic is presented in solution without blood in a percentage of 0.015 all perceptible beat, both of the auricles and ventricles, is extinguished, but can be restarted when chloroform is withdrawn and a physiologically competent fluid is perfused. More prolonged perfusion with this concentration destroyed the ventricular beat, although the auricular beat was recoverable after a perfusion of five minutes of chloroform-free solution. The resistance of the auricle muscle to $CHCl_3$ in such high percentages appears to be much greater than that of the ventricular. With a concentration of 0.003 per cent. the ventricular beat was in some experiments temporarily abolished. The reduction of its beat varied in different hearts between 15 per cent. and 95 per cent., the auricular between 45 per cent. and 85 per cent, with a mean of 66.8 per cent. in 21 experiments. The weakening of the auricle did not occur so rapidly as did that of the ventricle. With so low a concentration as 0.001 per cent., only a slight reduction of the beat took place, the ventricular averaging 21.7 per cent. and the auricular slightly more. Recovery was complete, but not obviously more rapid than after perfusion with stronger solutions. It is stated (p. 16):

> A notable feature of the action of $CHCl_3$ in dilute solution on the isolated mammalian heart is absence of all cumulative aggravation. . . . With strong $CHCl_3$ solutions the duration of the administration does, no doubt, aggravate the depression of vitality. . . . Of moderate and weak solutions it may be confidently asserted that on the mammalian heart their influence is marked by absence of cumulative effect. . . . It is the concentration of the $CHCl_3$ in the perfused solution which seems practically alone to decide the depth of the depression of activity produced.

It is added:

> The results of our dosage experiments suggest that the cardiac tissue exposed to a fluid of a certain $CHCl_3$ pressure takes up almost at once a certain quantity, and that further continued exhibition of the drug under the same tension does not lead to further relative absorpton of it by the tissue.

The work of Ringer also shows that the direct effect of chloroform upon the heart muscle when perfusing the organ is at first one of weakening, and ultimately causes loss of contractility with acute dilatation.

[1] Second Report. 1903, p. 9, Paper VI.

The experiments of Embley[2] dealing with the effects of chloroform upon the mammalian (dog's) heart isolated from the central nervous system are particularly important. In these experiments the drug was administered through the lungs by inflating them with air containing accurately known percentages of $CHCl_3$ vapour. The heart was not removed from the body, and continued to be fed by the animal's own blood, but by the ligature of all the large systemic vessels except one artery and vein, which were connected together by a glass cannula, the circulation was limited to the heart and lungs.

The heart is very sensitive to the action of chloroform. When the air inspired contained 0.8 per cent. chloroform vapour, blood pressure fell to zero in 17 min.; with 1.2 per cent. chloroform vapour, blood pressure fell to zero in 10 min.; with 2 per cent. chloroform vapour, blood pressure fell to zero in less than 2 min. The rapidity with which these quantities (0.8 to 2 per cent.) paralysed the isolated heart was surprising, for, so far, he had not succeeded in killing an intact animal by artificial inhalation and the vagi cut, with 0.8 and 2 per cent. in less time than five to six and one to two hours respectively.

The amount of blood in circulation in these experiments is probably not more than one-tenth of the animal's total blood, and the fact that 0.8 per cent. of chloroform vapour in the inspired air produced paralysis of the heart under these circumstances in 16 min. 25 sec. must be due to the rapidity with which the small amount of blood and of body tissue involved—heart and lungs only—becomes saturated with $CHCl_3$. Equilibrium between tissue and blood and between blood and air is therefore quickly obtained. For the same reason, when chloroform administration was suspended in these experiments the rapidity of recovery corresponded to the rapidity with which the heart was affected. No sudden failure occurs from the action of chloroform on the isolated heart. The fall of blood pressure is gradual or steep according to the percentage of chloroform vapour in the air administered, but there were no abrupt variations in the rate or efficiency of the heart such as occur in an animal with an intact nervous system.

McWilliam's experiments also indicate progressive dilatation and loss of function when choloroform in increasing percentages is brought into contact with the heart muscle. A large number of experiments carried out by Wood, Hare and Thornton, Dastre, Morat and Doyen, also by Gaskell and Shore, as well as those done by Leonard Hill, prove that in proportion as the strength of the chloroform is increased, respiration and circulation—the latter shown by the fall of blood pressure and weakening of the heart beat—steadily fail. When high concentrations are used the declension is more sudden, and may take the form of collapse. It is outside the scope of the present argument to discuss the differences of opinion which exist among those whose names we have mentioned, since they refer, not to questions of the results of low and high percentages of chloroform—on these they agree—but to the extent to which the different factors producing the results are concerned. Whether the dilatation of the heart or loss of the vasomotor centre control, or whether failure of respiration or circulation primarily cause collapse, are for the present purpose of less importance than to recognize that whatever be the order of events the result of inhaling percentages of chloroform above a certain level always and under all conditions leads to destruction of the essential mechanisms by which alone life can be prolonged. Dastre and other French physiologists, with Leonard Hill as well as many workers in this country, have recognized from their experiments that death from chloroform occurs early in the induction period. Embley[3] has shown experimentally that the principal factor in death under chloroform is the use of percentages over 2 per cent. He investigated vagus inhibition as a cause of circulatory failure, and it is clear from his work that chloroform increases the excitability of the vagus mechanism, particularly in the early part of the administration. This enhanced excitability of the vagus mechanism is due to the direct action of the chloroform upon the vagus centres. The diminution in the spontaneous excitability of the heart muscle itself consequent upon the action of the chloroform also renders the heart more readily affected by vagus action,

[2] BRITISH MEDICAL JOURNAL, April 5th, 1902.

[3] Causation of Death during the Administration of Chloroform. Reprinted from the BRITISH MEDICAL JOURNAL, April 5th, 12th, and 19th, 1902.

so that it is more liable to inhibition. Embley found (p. 5):

That when air containing more than 2 per cent. of chloroform vapour was administered, slowing of the heart ensued, and that when higher percentages were employed, the degree of the inhibition was rapidly intensified.

The slowing of the heart was accompanied by a steady fall of blood pressure which rose when the vagi were cut. When a 2.5 per cent. vapour was used inhibition of the heart occurred frequently, though ultimately the heart recommenced in all cases with this percentage. With 3 per cent. and upwards the recovery was not constant, the inhibition sometimes lasting too long for the heart to escape. In such cases the failure of circulation causing asphyxia also rendered recovery impossible. The reason why some hearts recover and some do not, appears to be that in the latter the heart muscle is too extensively damaged by the action upon it of the chloroform before the inhibition for it to be able to survive the effects, circulatory and respiratory, of the inhibition itself. Embley contends further that fatal inhibition through vagus action is always obtainable under chloroform provided the blood pressure has fallen to about 40 to 50 mm. Hg. It appears, then, to be well within the limits of our present knowledge to assert that fall of blood pressure due to chloroform inhalation is occasioned by (1) action of that narcotic upon the musculature of the heart and the muscular coats of the blood vessels causing paralysis; (2) slowing of the heart's beat; and, when the fall is sudden, to (3) inhibition. All these causative factors are effected proportionately to the strength of the vapour of chloroform inhaled, and so are entirely under the control of the person giving the chloroform.

As has been indicated again and again, the dangers of chloroform, when it is used without strict regard to its percentage value in the air inhaled, arise in part through direct overdosage, and in part through intercurrent conditions often themselves determined by the extended influence of the chloroform. Of these asphyxia is the most important. An attempt has been made by very careful observers to attribute to intercurrent asphyxia the main peril arising during chloroform inhalation. The grave danger of allowing any interference with respiration during inhalation of chloroform is too well recognized to need emphasis. This danger may arise whatever method of giving chloroform is adopted, and may be due not only to an overdosage by the anaesthetic, but to mechanical causes quite independent of the drug used. Faulty posture, foreign bodies in the upper air passages, pressure on the trachea by growths—for example, goitres—are all examples of this. Inadequate supply of air due to breathing through too narrow a tube of an inhaler apparatus which imposes excessive resistance is also urged as a cause of asphyxial complication. Also, it must not be lost sight of that any asphyxial complication renders the respiratory centre more sensitive to drug action, so that in its presence a strength of vapour which would under normal conditions be safe becomes dangerous and even lethal. But it is a mistake to suppose that chloroform is only capable of destroying life when asphyxial complications are allowed to intrude. As has been insisted upon above, chloroform acts directly upon tissues even when their normal supply of oxygen is maintained, and induces those bio-chemical changes which at first check the activities of their cells and ultimately destroys them altogether.

Experiments have proved that chloroform in percentages over 2 per cent., or even less, when inhaled continuously for a long period of time, is able to kill an animal in spite of the fact that artificial ventilation of the lungs has been practised and no asphyxia exists. Thus the continued inhalation of chloroform vapours of certain percentages destroys life. Not even the most assiduous attention paid to the respiration will prevent the occurrence of this danger if the vapour strength of the anaesthetic is maintained. It is quite true, as we shall see later, that respiration being secondarily affected interference with its rhythm or depth can be seen, and may warn of imminent danger. The warning thus conveyed will, however, in many or even in most cases, come too late if a high percentage of chloroform is allowed to persist in the inhaled air.

Sherrington and Sowton have shown that the heart more readily loses its irritability when chloroform reaches it in a circulation which has been freed from oxygen. They have also demonstrated the truth of the converse—namely, that the greater the amount of oxygen the more capable is the heart of resisting the depressant action of chloroform.

The weakening of the heart is associated with a fall in blood pressure—a result assisted by the effect of imperfectly oxygenated blood upon the vasomotor and respiratory centres.

The blood pressure may decline quite gradually, and the lessening in the thoracic movements may also be so gradual as to escape observation. At a certain point in this fall of blood pressure the nerve centres will cease to receive sufficient oxygenated blood to enable them to carry on their function and respiratory failure occur. There are two danger points in this procession of events: the first occurs when the heart and nerve centres are weakened by failing blood supply, since they are then peculiarly liable to vagus inhibition; and the second is the final cessation of respiration, associated as it is with an emptied arterial system.

Experiments have shown that the fall of blood pressure is directly proportional to the strength of the chloroform vapour inhaled. Respiration can only continue so long as the blood pressure is maintained above a certain level, and the maintaining of this necessary level is, during chloroform administration, simply a question of the strength of the vapour supplied. During a prolonged administration other conditioning circumstances also arise, such as loss of blood, shock, and so on, and these render it necessary to lessen the strength of vapour supplied in order to counteract the increased tendency of the blood pressure to fall.

Embley further insists that "with a good blood pressure failure of respiration by inhalation of chloroform is practically impossible." It must be remembered that "a good blood pressure" can only exist when the percentage of chloroform in air inhaled is lower than 2 per cent. He adds: "Restoration of failed respiration is dependent upon restoration of blood pressure." Respiratory failure during the period of induction occurs as frequently after as it does before the heart ceases to act (Embley). Leonard Hill, although his experiments were not performed with definite percentages of chloroform, came to a like conclusion.

Embley has emphasized how easily the causes which interact, dominating respiration and circulation, promote the establishment of a vicious circle, and him we may quote in summary of this section. A patient breathes an overstrong percentage vapour of chloroform—that is, over 1½ per cent., or 2 per cent., as the case may be; cardiac inhibition occurs, and in its turn produces a dangerous fall of blood pressure, and as a result the respiration ceases, and the asphyxia consequent upon this increases the inhibition and prevents the heart escaping from the vagus action. An unduly strong percentage of chloroform vapour taken by deep breaths, if the circulation is vigorous as in healthy, strong persons, will rapidly enter the coronary circulatory system, paresing the heart muscle by its direct action. This occasions fall of blood pressure, and then, in its turn, brings about respiratory failure. The breathing having ceased asphyxia is produced, and with its advent vagus inhibition occurs, resulting in a further fall of blood pressure, and so the inhibition becomes fatal.

Individual Susceptibility to Chloroform.

Another point of importance which is brought out in Professor Sherrington's work on the heart is that of individual dosage. He found that the lower animals evinced distinct variations in their reaction to chloroform, and this is equally true of human beings. Although all subjects are rendered anaesthetic by inhaling up to 2 per cent., they differ in the respect that some take longer to reach the third degree than do others. This is, of course, a question of saturation, and its importance lies in the danger of continuing a 2 per cent. vapour to those who become rapidly saturated. The heart muscle is the most sensitive; 1,000 mg. of chloroform to the litre quickly and permanently abolishes the beat. This dose produces no obvious depression when exhibited to voluntary muscle; 2,500 mg. to the litre is not more poisonous to such tissue than 333 mg. chloroform to the litre is to the heart.

These experiments show how extremely sensitive cardiac tissue is to chloroform, and how the gradation of the effect of the anaesthetic upon the myocardium is proportional to the concentration of the chloroform within the limits of its solubility. The gradation of the action of the drug is, therefore, a function of its tension in the solvent.

A considerably higher concentration of chloroform is required when presented to the heart tissues in a circulation of blood compared to a saline fluid. This must necessarily follow from the greater solubility of $CHCl_3$ in blood. The same amount of $CHCl_3$ added to an equal volume of blood and saline gives a smaller tension in the former, the tension being the measure of the free chloroform. The further explanation may be hazarded that blood maintains greater tissue vitality, and so antagonizes the depressant action of the chloroform. Or, putting the same thing in other words, if chloroform acts by checking the catalytic processes in tissues, it could do so less readily when the tissues were sustained by blood than when they were merely washed through by saline. We see, then, that both the blood vessels and the heart react when chloroform is brought into contact with them, and the effects produced are directly proportional to the concentration or dosage of the anaesthetic. Within certain limits, small and medium concentrations, the effects are not increased by the duration of the contact with the drug, in the case of tissues isolated from their normal physiological environment. When the percentage is lessened or increased, the effects produced are always and at once diminished or enhanced. Up to a certain percentage concentration, the declension of the heart's beat and the alteration of the vessel's calibre is recoverable when the chloroform is withheld and a circulation maintained which contains no chloroform. The drug in this case passes from the tissues to the fluid.

Influence of Oxygen Supply upon the Effect of Chloroform.

In certain of the experiments the circulating fluids were oxygenated, and their oxygen content was maintained whatever percentage of chloroform was employed. In the intact animal, for example, during surgical anaesthesia under chloroform concomitant circumstances may occur which influence the supply of oxygen to the tissues. It is, then, important to learn what alteration in effect does occur when definite percentages or concentrations of chloroform are exhibited to tissues the oxidation of which is imperfect. Sherrington and Sowton[1] have demonstrated that concentrations of chloroform capable of depressing, although not of abolishing, the heart beat produce greater depression when oxygen is not present but is replaced by carbonic dioxide, and that the depression is under these circumstances more persistent and more difficult to remove by perfusion with a chloroform-free circulation. These experiments explain the recognized clinical observation that patients under chloroform who are allowed to become "blue" very rapidly show signs of toxaemia. It is commonly believed that the danger of asphyxial complication is one affecting the medullary centres, and no doubt this is so, but associated with this is the increased liability to permanent damage to the tissues of the body, especially of the myocardium. The chances of recovery in such cases are dependent, as the experiments show, upon the tissues, and when these are deprived of oxygen and their chloroform and carbonic dioxide contents are increased, such chances of recovery are small, and wholly dependent upon the extent of the deoxidation and the chloroform toxaemia.

Effect upon Blood Vessels.

Bowditch and Minot came to the conclusion that the effect of chloroform was to cause dilatation of the blood vessels. Gaskell and Shore demonstrated by their cross-circulation experiments that in the early stages of chloroform administration the direct effect upon the vasomotor centre is stimulative. Embley confirmed these results, but has shown that the net effect on the whole body is one of vaso-dilatation. Although the medullary centres are stimulated, the subsidiary mechanisms, for example, either in the cord or the nerve endings in muscle, or the muscle of the arterial wall, or all three, are from the first paresed. Schäfer and Scharlieb[2] found that perfusion of frogs with a solution of chloroform in saline produced constriction and not dilatation. Their results may be explained, as is pointed out by Embley and Martin,[3] by the fact that they employed a percentage of chloroform in their experiments unattainable by respiration.

In the following year Schäfer and Scharlieb[4] extended their observation on the effect of perfusion of Ringer's fluid containing chloroform, to isolated mammalian organs, namely, kidney, heart, and limbs, and arrived at the result that, whereas with the last two chloroform of various strengths produced either no effect, or else constriction, with the kidney, on the other hand, solutions containing 1 in 20.000 to 1 in 1,500 of $CHCl_3$ occasioned dilatation, but stronger solutions produced constriction.

In Embley and Martin's experiments an artificial circulation was sent through the isolated bowel or kidney, in order to determine in this way the action of chloroform in anaesthetic quantities upon the peripheral vessels separated from the central nervous system. Only undiluted defibrinated blood was used, and this was perfectly oxygenated by having a double circulation in which it was pumped first through the isolated lungs of the animal, and then by a second pump through the organ (the small intestine or kidney) and returned to the lung circulation.

The chloroform was administered in the air with which the lungs were rhythmically inflated by a mechanical pump. The strength of chloroform in the air used for inflation was controlled and determined by the method used by Embley and described in the BRITISH MEDICAL JOURNAL, April, 1902.

They point out that the results of Schäfer and Scharlieb and their own are not contradictory, but apparently supplementary, and it is interesting to find that the vessels of different parts of the body react in such an opposite manner to the same poison. In chloroform poisoning the dilatation would appear to be more or less confined to the splanchnic area.

The splanchnic area can, however, accommodate the whole blood of the body, and they remain firm in the conviction that the action of chloroform in the blood in such quantities as may occur with the inhalation of 1 to 3 per cent. vapour is to directly paralyse the neuro-muscular mechanism of the blood vessels of the kidney and bowel, and that a considerable part of the fall in blood pressure which is constantly associated with the administration of chloroform may be accounted for in this manner.

The view advanced by Sherrington and Sowton that chloroform when perfusing the isolated heart produces constriction of the arterioles, is not accepted by Martin, as he points out that all substances (including atropin) which diminished the efficiency of the cardiac contractions also diminish the flow through the heart, and do so even when the pressure and other conditions remain constant.

Effect upon Muscle.

Chloroform acts upon voluntary muscle in the same manner as upon the heart muscle. The former is, however, much less sensitive, in other words the dose of chloroform required to produce abolition of contractility in voluntary muscle is far larger than suffices to annul the ventricular beat. Involuntary muscle fibre, excepting the muscles of the heart and blood vessels, is again less sensitive than voluntary muscle, so that as regards their susceptibility to chloroform muscular tissues must be placed in the order (1) the musculature of the heart and blood vessels, (2) voluntary muscles, (3) involuntary muscular fibre, for example, intestinal muscles, uterine fibres. It is generally true that the more highly functionating tissues evince the greater sensibility to chloroform, a lower percentage paretising function and ultimately annulling it.

Effect upon Nerve Tissues.

Isolated Peripheral Nerves.

Waller has shown with great precision that chloroform affects isolated nerve directly as the concentration varies, and that it resumes its function upon withdrawal of chloro-

[1] Fifth Report, p. 11.

[2] *Proc. Physiol. Soc.*, 1903.
[3] *Journ. Phys.*, vol. xxxii, p. 148.
[4] *Trans. Roy. Soc. Edin.*, 1904, vol. xli, p. 31.

form provided the concentration is below a certain percentage, but loses its irritability permanently when high percentages are brought in contact with it.

Professor Waller's method is briefly as follows: A nerve preparation is placed in a gas chamber into which can be blown chloroform vapour. The nerve is excited by electrodes connected with a secondary coil and the magnitude of the electrical response to stimulation is taken as an indication of the functional activity of the nerve. This is measured by a galvanometer outside the chamber. The movements of the spot of light shown by the galvanometer are photographed. When chloroform vapour is blown into the chamber the nerve becomes anaesthetized, or "immobilized," as Professor Waller prefers to term the condition, and gives no response to excitation. The method enables the experimenter to demonstrate the effect of different strengths of chloroform vapour, and that a certain dose of the anaesthetic not only "immobilizes" the nerve but destroys its conductivity.

Effects of Chloroform on the Nerve Centres.

It may now be pointed out that all nerve structures appear to follow the same laws as those demonstrated by Waller for isolated nerve: they either incur depression of function, from which they can be recovered by withdrawal of the chloroform, or they are destroyed. The margin between mere temporary loss of function and permanent paralysis is a narrow one. The behaviour of nerve centres exhibit much more complex effects when brought into contact with chloroform. Take, for example, the effect upon the vagus and the centres in the floor of the fourth ventricle. We do not as yet know with any degree of accuracy what differences exist in the reactions towards chloroform of various nerves and nervous mechanisms of different function. That differences exist is shown by Sherrington and Sowton, as by others. In their research upon the differences of the effects produced by chloroform upon the different kinds of muscular tissue, they found that[1] the susceptibility of the intramuscular nerve twigs and motor nerve endings to the influence of chloroform was less than was expected; indeed, it was less than that displayed by the tissue of the heart wall.

Much of our knowledge of the action of chloroform upon the nervous system we owe to the researches of C. Bernard. Under the influence of this anaesthesia there is a progressive but continuous loss of function of the centres. The highest centres of the cerebral hemispheres are the first to be affected, consciousness disappears, and successively the lower centres lose their activity. Excitement, more or less marked, follows, and although stimulation from without is no longer responded to by voluntary movements reflex and co-ordinated muscular action takes place. The loss of sensation in nerves is from the periphery to the centre (C. Bernard). The spinal cord gradually becomes affected, sensory nerves cease to respond before motor nerves, reflex action persisting after sensory perception has been lost. The reflexes disappear in regular order, the superficial are lost early in narcosis, the deep persisting until the narcosis is deepened. The patellar reflex is exaggerated in early narcosis but rapidly disappears, occasionally to be followed by muscular tremor of the lower limbs. The medulla oblongata is only affected late, and although rendered less excitable during normal anaesthesia, it is not paralysed until a degree of narcosis is reached which is inconsistent with life, since respiration and circulation can no longer be sustained. The conjunctival reflex is lost in the third degree of narcosis, and almost simultaneously the eyeballs become fixed and pupillary reaction grows sluggish. In profound narcosis the pupils no longer respond to light. The nasal, anal reflexes, and, according to Dastre, the reflex of the lower lip excited by pinching the incisor area of mucous membrane persist into deep narcosis.

Effect of Chloroform on Respiration.

As pointed out in the previous paragraphs chloroform suspends the activity of all nervous structures. The groups of nerve cells comprising the respiratory and vasomotor centres are, however, considerably more resistant to its influence than the majority of nerve cells. It is for this reason that it is possible to employ it for the production of anaesthesia. The range of sensibility of different nervous mechanisms to chloroform has not been determined, because it is impossible to ascertain what the tension of chloroform surrounding the nerve cells may be, but it is probable that it is not a large one.

We now know[2] that quite from the commencement of inhalation of chloroform respiration is affected. The breathing becomes slower and more shallow from the second minute up to the sixth or eighth minute. Hughlings Jackson has pointed out that the actual muscular movement of expiration is more notably affected early in the induction period.

The depression of respiration varies in extent in different animals, and probably varies within limits in different individuals. The depression is also dependent upon the degree of concentration of the vapour offered—a factor of cardinal importance in the practice of anaesthesia.

If chloroform of 1 or 2 per cent. be administered long enough to an animal the respiration will ultimately cease, and the stronger the vapour the shorter will be the interval before this occurs.

Such slow gradual impairment of the activity of the respiratory cells must, however, be very rarely a cause of death in the administration of this anaesthetic.

The majority of accidents occur within the first fifteen minutes of the commencement of the anaesthetization, and are complicated with simultaneous happenings to the circulation.

The experiments of Gaskell and Shore,[3] Hill,[4] and Embley[5] have shown what an important influence the blood pressure exercises upon a respiratory centre already to some extent depressed by chloroform. From a very extensive series of experiments Embley came to the conclusion that with a good blood pressure failure of respiration by inhalation of chloroform is practically impossible, and that restoration of respiration after failure is dependent upon restoration of blood pressure.

The influence of circulatory disturbances upon respiration, and the interdependence of these two physiological mechanisms, has, however, already been adequately discussed in the section devoted to the circulation.

Some Effects upon Respiration during the Induction Period.

There is a marked difference when the phenomena are compared between the way in which patients are affected by strong and weak chloroform vapours.

Breathing of strong or moderately strong vapours (2 per cent.) produces holding of the breath and even spasmodic closure of the glottis. The patient feels distress from the feeling of impending suffocation. The breath held for a period is followed by a violent and deep inspiration, and the lungs are flooded with the vapour of chloroform. The main feature of such cases is the irregular breathing; its chief dangers are the sudden intake of an excessively strong vapour, which paralyses respiration, and may also cause reflex arrest of the heart; the strain imposed upon the heart is due to interference with pulmonary and systemic circulation, and the rapid rise of chloroform tension in the blood causes tissue poisoning, fall of blood pressure, and respiratory arrest. In contrast: When the chloroform vapour inspired is weak—that is, 0 5 per cent. or thereabouts—the patient respires easily, has no sense of discomfort, and in time goes to sleep. He does not become anaesthetized. Gradual increase of the strength of the vapour up to 2 per cent—the limit imposed by Snow (in his experiments), Bert, Waller, and the present Committee—develops anaesthesia in a variable time, differing in individual cases, but averaging about six to eight minutes.

SECTION III.

THE DOSE OF CHLOROFORM.

Although in his first trials of chloroform Simpson did not attempt to associate with any definite doses the conditions of (*a*) anaesthesia, (*b*) respiratory failure, or (*c*) circulatory collapse, he very early recognized the dangers of using unduly large quantities of chloroform, since the

[1] Fifth Report, p. 12.

[2] Fifth Report, T. G. Brodie and S. T. Widdows, Appendix I, British Medical Journal, July 14th, 1906.

[3] British Medical Journal, 1893, pp. 106 and 171.

[4] Ibid., 1897, p. 960.

[5] Ibid., 1902.

"unstinted quantity" only remained a non-lethal dose when all circumstances were favourable. Such circumstances he recognized were regular breathing, the atmospheric condition and the constant supply of air sufficient to dilute the chloroform to a "safe" percentage. What the percentage was wherein safety lay Simpson did not inquire. He, however, recommended a more careful method than that at first adopted for giving chloroform, since many deaths had occurred as a result of chloroform inhalation. His words are "*one* single layer of a towel or handkerchief is laid over the patient's nose and mouth, care being taken not to cover the eyes, and on this single fold the chloroform is poured drop by drop, until complete anaesthesia is induced."[1] This was written in 1860. In 1883 M. Bert communicated Dr. Peyraud's "drop method," which is merely a systematic plan of regulating the supply of chloroform inhaled at each inspiration. Neither observer proved experimentally what dosage the systematic dropping represented, although Peyraud calculated his dosage as being 2 per cent. to 2.8 per cent., but he regarded lower percentages as sufficient.

It is important, if we are to understand correctly the work and words of the earlier investigators, that we should appreciate the fact that their method of administering chloroform differed wholly from that adopted at the present time, in that they pursued an intermittent plan. Anaesthesia was induced, then the anaesthetic was withdrawn, only to be reapplied if the person giving the chloroform found that consciousness was beginning to return. This plan, while it increased the danger of the patient through the constant change in the level of chloroform tension, possibly preserved him from the danger due to prolonged irrigation of the tissues by chloroform-laden blood.

Snow upon hearing of Simpson's experiments with chloroform at once commenced to experiment with it upon animals. He placed them in atmospheres with a known percentage of the drug and calculated what such percentage actually represented as dosage in the entire animal. These are his conclusions:

> Percentages below 1 per cent. fail to produce anaesthesia.
> Percentages from 0.96 to 1.5 per cent. produce anaesthesia.
> Percentages from 1.7 per cent. to 2.9 per cent. interfere with respiration.

The experiments were carefully performed, and although Snow possessed none of the physiological apparatus which is at our command to-day, his work laid the foundation of a scientific knowledge of anaesthesia. Snow estimated that the lethal dose was about double the anaesthetic dose.

Snow proceeded to adopt a dosimetric method[2] and his inhaler (see section on Regulating Inhalers) supplied a possible 5 per cent., although, it must be remarked, his experiments upon animals proved that 2 per cent. was adequate for anaesthesia and 4 per cent. was the lethal dose. This contradiction is explained by the following considerations.

The inhaler was capable of giving only approximately a 5 % percentage, and the percentage was subject to considerable variations. This Snow appreciated, and safeguarded himself and his patients by admitting air into the face-piece by means of a valve. This in practice lessened the amount of vapour given to 2 or 2.5 per cent. Further, Snow adopted the intermittent plan and cut off his vapour as soon as anaesthesia was induced. It is not too much to say that Snow, while working with an inhaler which might supply an unduly high percentage vapour, did not actually employ the maximum limit of its capacity.

The anaesthesiometer of M. Duroy was described in *Journ. de pharm. et de chir.*, Mars, 1856. It was a very ingenious machine designed to supply automatically 4, 10, 25, 40, or 60 drops of chloroform per minute upon a tray on which were circles. The area of evaporation was made to vary directly as the strength required. The patient inhaled through a face-piece and tube air which passed over the evaporation area. Intermittent inhalation was practised.

Snow's criticism upon the chloroform machine of Duroy, the anaesthesiometer, points out that although the *quantity* of the anaesthetic was regulated, the dilution of the portion inhaled was not, and hence the dosage was inexact and out of control. No sufficient provision was made in the anaesthesiometer to meet the variations of respiration, so that while excessive doses might easily be given, insufficient doses were also possible and fatality or failure was always imminent.

We now come to a further definite attempt to arrive at precise dosage of chloroform. In 1881 Paul Bert read his communication to the Société de Biologie.

Working by experiment upon animals, Bert showed that 2 per cent.[3] was competent to produce full and complete anaesthesia. Percentages below this produced only heavy sleep, and percentages above 2 rapidly killed the recipient.

Further results claimed by Bert, as proved by his experiments, went to show that it was the percentage strength of the vapour inhaled which killed, and not the quantity ultimately taken into the organism. He says:

> En d'autres termes le chloroforme n'agit pas par la quantité qu'on respire, mais par la proportion qui s'en trouve dans l'air inspiré.[4]

He showed that prolonged inhalations of percentages of chloroform, although too weak to cause insensibility, determine death, after being inhaled continuously for some hours. Thus Bert was led to believe that metabolic function was destroyed before the higher nerve centres were attacked.

The following tables explain these results:

TABLE I.—*Percentages by Volume of Vapour.*

Anaesthetic Dose.	Lethal Dose.	Ratio.
Dog 1.8 (9 grams à 100 litres of air) ...	3.8 (19 à 100)	2.1
Mouse 1.2 (6 grams à 100 litres of air) ...	2.4 (12 à 100)	2
Sparrow 1.8 (9 grams à 100 litres of air)	3.6 (18 à 100)	2

TABLE II.—*Dog.*

Percentage.	State.	Died.	Rectal Temperature.
0.8 (4 à 100)	Sensible	Alive after 9 hours 30 minutes	To 35°
1.2 (6 à 100)	,,	Died in 6 to 7 hours	31° to 29°
1.6 (8 à 100)	Insensible, but easily roused	—	—
2.0 (10 à 100)	Insensible in few minutes	Died in 2 hours to 2 hours 5 minutes, no convulsion	35° to 33°
2.5 (12.5 à 100)	,,	Died in 1 hour to 1 hour 25 minutes.	35° to 34°
2.8 to 3.2	,,	Died in 40 minutes	39° to 37°
3.6 to 4	,,	Died in 30 minutes	—
6		Died in 3 minutes	—

We may summarize Bert's conclusions:

1. Even large quantities of chloroform passing into the lungs over a lengthened period produce no objective phenomena except that of lowered temperature, provided they are introduced in low percentages.
2. Slightly higher percentages, when given for very long periods of time, kill without causing insensibility. The temperature is lowered, the nutritive functions apparently failing before those of the nervous system.
3. Higher percentages cause insensibility, and always kill when the inhalation is prolonged. The duration of life is inversely as the strength of the vapour. The more rapidly death occurs the less is the fall of temperature.
4. The animals evinced individual peculiarities as regards their reaction to chloroform, even when they appeared to be physically equivalent.
5. The heart-beats persisted after failure of respiration.
6. After inhalation chloroform is not found in the urine.

Bert next experimented to ascertain whether it was possible to obviate fatal results following prolonged inhalation. He found that employing a vapour of 2.4 per cent. (12 à 100) for induction and following this by a vapour of 1.6 per cent. (8 à 100) he kept the animals alive for three to five hours without failure of respiration or circulation.

[1] *Anaesthesia*, 1871, p. 179.
[2] *Chloroform and Other Anaesthetics*, p. 69 et passim. London, 1858.
[3] It may be well to note that Bert's figures are commonly misunderstood. He says "le nombre de grammes du liquide anaesthésique ajouté à 100 litres d'air," p. 769. Ten grams of liquid chloroform produce at 16° C. 1.98 litres of gaseous chloroform, and therefore when mixed with 100 litres of air give a mixture containing 1.94 of chloroform, very nearly the 2 per cent. of our notation. In all cases we have translated Bert's figures into the English notation, in order to avoid confusion.
[4] *Comptes rendus*, vol. xciii, p. 770.

He then applied his method to producing anaesthesia in human beings for surgical purposes. A vapour strength of 1.6 per cent. was used in most cases, a complete mixture of air and chloroform vapour being effected in large gasholders.

The induction period was about seven minutes.

In his second communication (1884) he details a number of cases anaesthetized with this strength vapour (1.6 per cent.), and reports absence of sickness, excitement, or other unpleasant complication. He appears to have employed a *continuous* administration, and in some cases to have obtained the best results with even more dilute vapours.

Subsequently Bert, Quinquaud, and others adopted another method of obtaining low-tensioned vapours. Alcohol, olive oil, or other materials were added in definite proportion to ensure a definite rate of evaporation of chloroform. The same idea was advanced by the Committee of the Royal Medical and Chirurgical Society, the report of which was issued in 1864. In it were proposed mixtures of alcohol, ether, and chloroform, and others containing chloroform and ether. These mixtures have been employed also in France, Germany, and England by various advocates of mixtures. Mixtures of this kind, however, when used in clinical apparatus, give very variable quantities of chloroform vapour.

Dr. Junker also designed an apparatus for pumping air through a liquid anaesthetic. It was used originally for giving "bichloride of methylene," but later also for chloroform. The original pattern was open to many objections, and was never accurately tested to ascertain the precise percentage of chloroform vapour it delivered under various circumstances. It is described in the section on Regulating Inhalers (p. 63).

R. Dubois,[1] a pupil of Bert, further increased our knowledge. He reaffirmed Bert's method of *mélanges titrés*, and described the most ingenious mechanical apparatus (see section on Regulating Inhalers) which goes by his name, and is one of the most accurate means for obtaining exact percentages of chloroform in air. By the arrangement the patient breathes from a *plenum*, and so has no added mechanical difficulty in performing respiration.

The apparatus consists essentially of a mixing chamber, and is controlled by a handle which works a wheel. Each turn causes a definite volume of air to enter and a definite amount of chloroform to be evaporated into it. A simple adjustment permits of percentages up to and including 2 per cent. to be presented to the person inhaling. The percentages can be varied according as the exigencies of the occasion may require.

It may be noted that various attempts have been made to arrive at the dosage of chloroform given by other methods, and these may now be considered.

Lord (then Mr.) Lister in 1861,[2] in an article contributed to *Holmes's System of Surgery*, discussed the percentage value of chloroform vapour supplied to patients by different methods. He criticized Snow's view that chloroform deaths

> could result only from a faulty method of administration; and, assuming that when chloroform is given from a folded cloth it is apt to be in too concentrated a form, he attributed most of the deaths which have occurred to paralysis of the heart from this cause,

and experimented to ascertain what percentage of chloroform vapour is inhaled from a cloth. Lord Lister points out that much of the vapour evaporating from the lower portion of the cloth is blown away by the patient's expiration, and even so he asserts the optimum value of the evaporation is below that assigned by Snow as competent to produce cardiac paralysis, that is, over 5 per cent. The plan of the experiment was: A cloth such as is used in practice, was supported by a light wire framework, and suspended a short distance from the floor by a thread connected at one end to the beam of a balance. The weight of the cloth having been ascertained, a weighed quantity of chloroform equal to ʒjss (average quantity used) was poured on the centre of the lower surface. This hung close above the mouth of the person experimenting, who expired against it, inspiring pure air through an india-rubber tube. The weights on the scale of the balance indicated the amount of chloroform lost by evaporation. The effect on rate of evaporation by inspiration was regarded as negligible—after other experiments. Various precautions were adopted, and allowance made for absorption of moisture by the cloth. The evaporation at 70° F. was proved to be, taking the average of several experiments, 24 grains per minute during the first half-minute (Snow estimated 20 grains chloroform corresponded to 15.3 cub. in. of vapour, and that 400 cub. in. of air are inspired per minute), equivalent to 4.5 per cent. Lord Lister adds:

> 5 per cent. being what Dr. Snow was led by his experiments to regard as the proportion at which the respiration was quite sure to fail before the circulation. . . . On the other hand Dr. Snow assumed that when the cloth is used at a temperature of 70° F. 9.5 per cent. of chloroform is really inhaled, whereas in truth, of the 4.5 per cent. a large amount is dissipated in the surrounding air.

Snow's actual words[3] are:

> If, for instance, a person inhales chloroform from a handkerchief or an inhaler, in such a way that the air he breathes shall be half saturated with the vapour, then supposing the temperature of the apartment, the handkerchief, etc., to be 50°, the air he breathes will contain 4 per cent.; but if the temperature be 70°, the air will contain 9.5 per cent. of the vapour.

The conditions of Lord Lister's experiment demonstrate that evaporation into unlimited space does not presumably produce a rate of evaporation competent to semisaturate the air inspired, but it does not invalidate Snow's statement, nor does it give us data to estimate what percentage of chloroform vapour actually enters with the inspired air under various degrees of respiratory effort. In 1882[4] Lord Lister discussed the then recently published work of Paul Bert, and undertook some experiments on mice to determine whether the percentages of safety and danger of Bert were admissible in all cases. The experiments were not numerous, but, as Lord Lister says, "although I have failed to verify M. Paul Bert's precise conclusions, yet I believe we owe him a debt of gratitude for his researches." Lister's experiments convinced him that:

> Even in animals which seem to have been peculiarly sensitive to the action of chloroform, atmospheres which produced anaesthesia in a very few minutes did not cause death till they had been continued in action considerably more than an hour. These atmospheres had the peculiarity of being, on the one hand, extremely mild, and, on the other hand, constant in quality; and, assuming that effects more or less closely analogous would follow in the human subject, it is clear that we ought to make a systematic attempt to attain them. If for the fitful mode of administration by the folded towel, with atmospheres perpetually oscillating between the needlessly strong and the uselessly weak, we can substitute a method which shall give a uniform and at the same time a mild anaesthetic air, we may anticipate beneficial results.

But he adds (p. 165):

> Moreover, the facts which M. Paul Bert has elicited may well embolden us to continue a steady administration of the chloroform after the patient has been brought fully under its influence. For we know that, when complete anaesthesia has been brought about, a very much smaller proportion of the chloroform is needed for the maintenance of that state than was required for its production; all that is necessary being to supply enough to compensate for the elimination of the drug by the lungs and other emunctory organs.

It will be seen from these later writings of Lord Lister that his acute mind realized the value of a definite percentage atmosphere of chloroform vapour, nor was he slow to recommend that methods should be sought for which would satisfy the conditions of supplying a mild and uniform atmosphere and one capable of being lessened for maintenance of anaesthesia when once that state has been attained. While believing that dropping measured quantities of chloroform upon a cloth produced a safe percentage, he yet admitted that the method was open to the objection that it produced an atmosphere which always oscillated between what is "needlessly strong and uselessly weak." These words of Lord Lister's epitomize the whole argument in favour of administering chloroform by a method which controls the strength of the vapour and maintains it at a level of safety. Bert's subsequent trial of accurate percentage administration of chloroform to man fixed his *zone maniable* at 1.6 per cent. Lord Lister, by subsequent investigations, came

[1] *Anesthésie physiologique*. Par le Dr. Rafaël Dubois. Paris: Georges Carrét. 1894. (Pp. 34, 100 et passim.)

[2] See *The Selected Papers of Joseph Baron Lister*, Oxford, 1909, pp 135-175 passim.

[3] *Chloroform*, p. 34.

[4] Ibid., p. 161.

to the conclusion that about 1.2 per cent. by volume was sufficient for anaesthesia. This figure is of great interest as demonstrating that Lord Lister, although not advocating any regulating apparatus, yet recognized that the best and safest plan of giving chloroform centred round accurate dosage.

Dr. Waller, at the annual general meeting of the British Medical Association, 1897,[1] in his Presidential address on Anaesthetics in the Section of Physiology, dealt with the question of the dosage of chloroform and other anaesthetics from a novel standpoint. Taking isolated nerve, he investigated by a most ingenious method the effects of various percentage strength vapours of chloroform and of other anaesthetics. He demonstrated that while low percentages diminished nerve excitability, higher percentages destroyed the nerve tissue altogether. Pursuing the matter more in detail, Waller[2] experimented upon isolated nerve by various methods of giving chloroform. His conclusions were in harmony with those already arrived at by Snow and Paul Bert, namely, that 1 per cent was, for human beings, insufficient for induction, though sufficient for maintaining anaesthesia, and that 2 per cent. was safe and sufficient in most cases for induction, but too high for safe prolonged maintenance of anaesthesia. He presented vapours of chloroform at a value of 1 per cent., 2 per cent., 3 per cent., 4 per cent., etc., and found that the effect upon the nerve was directly as the strength of the anaesthetic vapour which reached it.

Waller considered, further, that the lethal dose was about double the anaesthetic one. In this estimate he agrees with that at which Snow and Bert had arrived independently.

Subsequently to the investigations of Waller the Committee examined the question of dosage.

In their second report[3] are given the results of the first trial of the dosimetric induction of anaesthesia by the Vernon Harcourt inhaler. In these cases a 2 per cent. was the maximum percentage employed, and the results demonstrated that 2 per cent. sufficed for induction, although a lower percentage was sufficient in some instances. Subsequent work has given better results, as the apparatus then in its trial stage has been made more exact. In the same report the dosage of the isolated mammalian heart was considered.[4] Sherrington and Sowton show the effect on the heart is one of depression, and this is directly dependent upon the actual dose of chloroform presented to it. They calculate:

> About 300 c.cm. of a 2 per cent. admixture of chloroform with air administered to an adult man, if its chloroform all reached the heart, and reached it under the above solution pressure, would, for the time being, practically annul cardiac action.

They point out that the problem is more complex, and that such a dosage reaching the heart in the intact animal depends upon many things, and that data are as yet wanting before we can solve the practical problems. It is, at least, clear that the heart is very sensitive to chloroform, and its safety depends upon dosage.

In 1903 the Committee made the following trial of inhalation of definite dosage upon human beings under test conditions. A member of the Committee and one of their assistants were the persons who inhaled. Two methods (*a*) inspiring air pumped through chloroform—the plenum system—and (*b*) air drawn over chloroform by the person's respiratory efforts, were employed. In each case approximate dosage was secured.

(*a*) A nominal dosage of 0.64 per cent. chloroform vapour in air was pumped synchronously with inspiration for ten minutes. No loss of voluntary movement occurred.

(*b*) A nominal value vapour of 0.5 per cent. was inspired for ten minutes without loss of consciousness. Both persons inhaling stated they could go on inhaling that dose of vapour indefinitely without inconvenience.

After a five minutes' interval a nominal 1.5 per cent. was given by the (*a*) method, 30 c.cm. of air being pumped at each inspiration. Anaesthesia was obtained in fourteen minutes, was light, and consciousness returned in under two minutes, 8.25 grams of chloroform having been consumed. By (*b*) method a nominal dosage of 1.0 per cent. was given, and response to light pricking with a pin was lost in eight minutes; in ten minutes the conjunctival reflex was sluggish, and became abolished in fourteen minutes. Consciousness returned in one minute; the consumption of chloroform was 7.0 grams. Under the conditions present the nominal percentages cited were probably higher than the actual percentages inhaled. The anaesthesia produced was a light one, and as a subsequent trial showed, was below the depth of narcosis requisite in surgical anaesthesia. There were no sequelae, such as nausea, headache, and so on.

In the Committee's fifth report[5] is given the investigation of the amount of chloroform retained in the body after definite dosage with various percentage value vapours. Patients in hospital inspired percentages—always below 2 per cent.—and the inspired and expired air was analysed. A member of the Committee, the same who underwent the experiment by the (*b*) method cited above again volunteered for experiment. Inhaling 1 per cent. the blood pressure sank, at first slowly, later more rapidly, from 130 mm. to 110 mm. Hg. With 1 5 per cent. it fell in ten minutes to 90. When the dosage was made smaller the blood pressure at once rose. Consciousness persisted with 1 per cent. for ten minutes, in fifteen minutes he gave no reply to questions, in twenty-five minutes conjunctival reflex was present and the dosage was increased to 1.5 per cent. In thirty-two minutes the breathing was noisy and conjunctival reflex abolished, and he was insensitive to painful stimulation. The dosage was steadily decreased and after thirteen minutes air only was given. In thirteen minutes after this he showed signs of consciousness, and in twenty minutes could answer a question. Besides these test cases the Committee examined in some detail the effects upon hospital patients inhaling definite doses of chloroform for surgical operations.

The actual mixture of chloroform vapour and air was estimated for chloroform both as it was inspired and when it was exhaled. The condition of the patients during the induction and maintenance of anaesthesia under the influence of different doses was studied. The results were uniform, although within the limits of the 2 per cent. range. The individuals differed; with some the induction time was long, with others short; with some a maximum below 2 per cent. was sufficient, others needed 2 per cent. to be inhaled for several minutes before complete muscular relaxation appeared.

EXAMINATION OF THE METHODS USED IN ADMINISTERING CHLOROFORM AND THE DOSAGE OF VAPOUR SUPPLIED.

These fall into the categories:

A. Open methods.
B. Methods in which some inhaler is employed.

A.—Open Methods.

These methods, as employed by Simpson, Syme, Lister, Lawrie, Esmarch, Schimmelbusch, and others, depend upon two main plans.

The Douche Method.

In this method known quantities of chloroform, usually one or two fluid drachms, are poured upon an evaporating surface of lint, cambric or some such material, and supplying a vapour which, being held at a distance of 2 or 4 in. from the face, is breathed freely mixed with air. The quantity of chloroform is renewed when the first supply is exhausted. In other plans a metal frame (Skinner, Esmarch, Schimmelbusch) is covered with lint or domette and the chloroform poured on this. Another way is to fold a towel or handkerchief into a cone and pour the anaesthetic into the apex. The Hyderabad method replaces the towel by a calico cone strengthened by thin wood cut into strips like whalebone, with cotton-wool in the apex of the cone.

The Drop Method.

The drop method differs from the douche method in that drops of chloroform are allowed to fall at a given rate upon the surface of evaporation. These drops vary in size according to the dropper in use, while the strength of the vapour varies according to the physical conditions, such as the nature of the surface, the area wetted, the temperature, air currents, and so on.

[1] BRITISH MEDICAL JOURNAL, November 20th, 1897.
[2] BRITISH MEDICAL JOURNAL, April 23rd, 1898.
[3] BRITISH MEDICAL JOURNAL, July 18th, 1903.
[4] See Sect. II, p. 50, "Physiological Processes of Anaesthesia."
[5] BRITISH MEDICAL JOURNAL, July 14th, 1906.

Various attempts have been made to determine the accurate dosage involved when such methods are in use, and these we propose to deal with in this place.

Lister's experiments have been already cited, and, as has been seen, his estimate was that a dosage of between 4 per cent. and 5 per cent. was attained when douching with ʒjss doses, while lower percentages, ranging from 1.5 to 3 per cent. were reached when a limited area of towel was kept wet by a carefully regulated supply of chloroform. Waller, assisted by J. H. Wells, the assistant appointed by this Committee, examined the dosage of the drop method in 1904.[1] They stated that the "drop" varies according to the size of the orifice through which the $CHCl_3$ chloroform escapes, but this is not the chief condition, which is the area (thickness of tube wall) on which the drop forms. Thus Eschbaum gives 38 mg. (7.6 c.cm. of vapour), Dubois 66 mg. (13 2 c.cm. of vapour). Waller gives 20 mg. to 25 mg. (4 to 5 c.cm. of vapour) when the drop falls from a stoppered bottle, but when the drop is given from an average pipette its weight is practically uniform. Waller further states that a drop of chloroform the vapour of which is inhaled in an ordinary inspiration of 400 to 500 c.cm. supplies a 1 per cent. vapour of chloroform in air. Waller, by estimations with his densimetric method, has shown that the ordinary percentage of chloroform vapour and air presented to the patient by the open method—lint or a towel being used—lies between 1 and 2, but it may reach 10 per cent. or more if the surface of evaporation is closely applied to the patient's face. By pouring drops of chloroform upon a layer of absorbent material resting on a frame and aspirating air from beneath it,[2] Waller estimated the percentages of vapour supplied under varying conditions of the experiment. He demonstrated that the possible percentages varied from a safe zone—that is, 1 to 2 per cent.—up to those of lethal strength.

W. Legge Symes sought to determine the concentration of chloroform vapour in air drawn from beneath a Skinner's mask.[3] The amplitude of the aspirations were measured by a spirometer, the percentage of chloroform by a densimeter; the temperature and barometric pressure were noted. Chloroform was applied to the mask (*a*) by continuous dropping, or (*b*) by a single douche. The concentration of the vapour in the densimeter was practically constant for an indefinite period during continuous dropping; after a douche it gradually subsided. With flannel on the mask a douche of 1 c.cm. after five aspirations gave 1 per cent., dropping to 0.8 per cent. after twenty aspirations; domette on the mask gave 1.6 per cent., and dropped to 1 per cent. A douche of 3 c.cm. gave 2.4 per cent. after five aspirations, and 1.6 per cent. after fifteen aspirations with flannel, but 2.9 per cent. and 2.1 per cent. with domette.

The effect of varying the quantity of chloroform applied to the mask is shown in the following table:

$CHCl_3$ Applied.	Amplitude of Aspiration.	Frequency of Aspiration.	Concentration of Vapour.
10 drops per min.	350 c.cm.	10 per min.	0.65 per cent.
20 " "	"	" "	1.0 "
30 " "	"	" "	1.4 "
40 " "	"	" "	2.0 "
43 " "	"	20 per min.	1.1 "
55 " "	"	" "	1.2 "
65* " "	"	" "	1.4 "
1 c.cm.† douche	400 c.cm.	10 per min.	1.7 "
1 " "	"	" "	2.1 "
3 " "	"	" "	2.5 "

* 65 drops from burette = 1 c.cm.
† Estimations made in this series after 10 aspirations.

The concentration in the densimeter did not increase proportionately to the amount applied to the mask. When the frequency of aspiration was varied while the amplitude was constant, it was found that increased frequency produced lowered concentration of vapour. Further, for a given quantity of chloroform used, greater amplitude led to lower concentration, but the effect of varying amplitudes is less marked than that of varying frequency. These experiments show that at ordinary room temperatures with moderate and approximately equal quantities of chloroform, the Skinner's mask supplies 1 and 2 per cent., but 3 to 4 per cent. or more when the chloroform is copiously applied. Open fabrics supply a higher percentage vapour, and with the douche less uniformly sustained concentration, aspirations of lower frequency and smaller volume give greater concentration. The drop method gives more uniform effects than the douche.

Although, as is pointed out, the conditions obtaining in the experiments may not be entirely reproducible in the actual use of a Skinner's mask for a living being, yet they are sufficiently alike to demonstrate the increased dosage which occurs in practice when the respirations become slow and of lessened amplitude.

Levy,[4] in his experiments upon this method, employed a bellows to counterfeit human respiration so arranged as to regulate the volume of air drawn in by suction (inspiration) and driven out by expulsion (expiration). With regard to the effect of temperature Levy found:

> A required anaesthetic effect may be perfectly maintained in spite of temperature variations, provided that definite and small quantities of chloroform be applied at definite intervals of respirations. When large quantities of chloroform are being evaporated, a prolonged and slow series of temperature changes may result and will no doubt give rise to varying tensions which will be sufficiently long-continued to induce corresponding general anaesthetic effects.

The effect on dosage of the material of fabrics used as evaporating surfaces is also shown by Levy to be considerable, while the permeability of the material again introduces further possible discrepancies in rate of evaporation and therefore of dosage; "breathing through" and "breathing over" are dosimetrically different matters. The area of evaporation determines the amount of evaporation, and hence the fabric which allows "spread" of the chloroform supplies a larger evaporating area. Loosely woven materials such as domette, by allowing air to permeate and take up the chloroform held in suspension in the tissue which is being tested, afford a higher percentage vapour than do the closer woven fabrics such as linen. The effect of withdrawal of the mask to varying distances from the face was examined. Variations in the force of breathing produce material differences when the surfaces are approximated, but very slight when the mask is at a considerable distance from the face. The use of an impermeable material renders regulation of the vapour strength practically impossible. The folded towel, masks covered with more than one layer of lint, etc., fall into this category, since, although one layer is pervious to the breath, two or more are not so. A further disturbing factor is the damping of the lint or cloth by the moisture from the breath. A single layer of domette gave percentages of chloroform nearly proportional to the fraction of the area wetted when aspiration only was practised. Levy adds:

> Unfortunately this relation fails under the double-phased aspiration—alternate suction and propulsion [inspiration and expiration]—when the lower percentages are raised in value and the higher are lowered.

It thus appears that the accuracy of a percentage value of chloroform administered by the "open" or quasi-"open" methods is dependent upon many factors.

Dr. Levy considers that by the open method an approximate percentage is obtainable if the depth of respiration, the area of spread, the temperature, and so on, are closely watched and the supply of chloroform gauged to meet the necessities of their variations. This, it need hardly be pointed out, leaves so much to the individual, and makes so great a demand upon his special skill, power of observation, and accurate deduction, that it cannot be regarded as of universal application.

B.—Methods of Producing Accurate Percentages by Inhalers.

Various inhalers have been designed to supply definite percentages of chloroform. Most of these are described in detail in the section devoted to inhalers, but they may be mentioned in this place, since their successful use demonstrates the value of the method of definite dosing.

[1] *Lancet*, July 9th, 1904, p. 76.
[2] BRITISH MEDICAL JOURNAL, November 28th, 1903.
[3] BRITISH MEDICAL JOURNAL, July 9th, 1904.
[4] BRITISH MEDICAL JOURNAL, August 4th, 1906.

Snow's inhaler (see Section IV, p. 63). In his record of cases Snow does not enter into detail concerning the dosage used in the individual cases.

Clover constructed an inhaler in 1864, which delivered a vapour of 4.5 per cent., the maximum strength which he regarded as safe (see Section IV, p. 63).

The mechanism of this consisted of a receiver of known capacity into which the required quantity of chloroform was injected, so that when fully vaporized the resulting mixture was of the desired chloroform tension. The patient breathed from the receiver by means of a face-piece and tube similarly to the arrangement in Snow's inhaler. Clover's inhaler is open to the objection that there is a liability in prolonged operations when the breathing is slow, that the heavy vapour of chloroform gradually settles in the receiver, and so it is difficult to secure an absolute uniformity of strength. This inhaler did not achieve popularity, probably owing to its somewhat cumbersome appearance, and to the fact that ether and ethydine dichloride rather usurped the inventor's attention in later years. That he used so high a percentage vapour with some success indicates the watchfulness and skill of the administrator. He adopted a method of continuous inhalation, but was able by opening a valve to give the patient access to a large extra supply of air and so diluted the vapour, and in this probably lay the secret of Clover's success. Although theoretically using a 4 5 per cent. vapour, he employed actually a much lower strength of vapour.

Bert's method, that of mixing chloroform vapour in definite proportion in gasholders, was only applicable to hospitals, and never passed beyond the stage of experiment. It is referred to later (Section IV, p. 64).

The invention of Dr. Junker's inhaler marked a further attempt to control the dosage of chloroform. The original model was open to many objections, and was never seriously tested by the inventor to ascertain what percentage of vapour the person inhaling actually obtained. Mr. Krohne, of the firm of Krohne and Sesemann, introduced some improvements, and attempted to standardize the strength of vapour delivered by compressions of the resistance ball.

Waller has investigated the percentages delivered from the modified [Krohne's] Junker's inhaler.[1] He points out that the three elastic balls which force air through the chloroform in the bottle deliver nominally 10, 30, or 60 c.cm. at each compression, and are intended to volatilize $\frac{1}{3}$, $\frac{1}{2}$, or 1 minim of chloroform. Assuming the inspiration to average 400 c.cm., the 10 c.cm. ball will supply 3 c.cm. of chloroform vapour equalling 0.75 per cent. in 400 c.cm. of air, the 30 c.cm. ball 9 c.cm., or 2.25 per cent., and the 60 c.cm. ball 17 c.cm., or 4.25 per cent.[2]

Experiments made to test the nominal values showed five compressions of the 10 c.cm. ball delivered to the flask 0.086 gram—that is a percentage = 4.0, or 0.8 per compression. Further flask estimations with the largest ball gave 3.13 per cent. against the nominal 4.25 per cent. in one case and a greater deficit (between 3.13 and 1.18) in others. Waller gives as an average for the three balls 0.016 gram $CHCl_3$ or 0.8 per cent. in 400 c.cm. of air, 0.036 gram or 1.8 per cent., and 0.070 gram or 3.5 per cent., against the nominal 0.75 per cent., 2.2 per cent., and 4.4 per cent. It was found, further, that the weight evaporated varied also when the area was varied, when the temperature of the chloroform altered, and also when the tube delivering the air into the liquid chloroform was more or less deeply immersed—that is, according as the air bubbled through a greater or less depth of anaesthetic. These experiments were made under laboratory conditions, and the accuracy of which cannot be reproduced during the actual clinical use of the apparatus.

Dr. Paul Chapman[3] has made experiments with the Junker method, and his conclusions are in accord with what is stated above. He found unless there is free admission of air to the face-piece a percentage of 5.2 or even higher is delivered. Warming the bottle gave 6.5 per cent., and the variations in the depth of the chloroform in the bottle produced marked differences in the percentage.

In 1884[4] Dr. Raphael Dubois, in conjunction with M. Tatin, devised the Dubois anaesthetic machine which delivers accurate percentages of chloroform in air. The inhaler is described in a succeeding section, but the results obtained with it may be noted here. With a dosage varying from 1 6 per cent. to 2 per cent. full surgical anaesthesia was obtained by Dubois and others in France.

The Dubois apparatus has been tried in London hospitals and elsewhere, and the percentages below and up to 2 per cent. have been proved by demonstration to have sufficed in the cases in which it was tested.

To obtain definite percentage values of chloroform in air, Mr. Vernon Harcourt designed his inhaler (chloroform regulator), and at the instance of the Committee, of which he became a member, modified the apparatus to its present form. Essentially it is an empirically adjusted inhaler, which enables the patient to aspirate air from over the surface of chloroform. By a very simple arrangement the apparatus allows percentages of from 0.2 per cent. to 2 per cent. to pass into the face-piece. It is described fully in the following section.

Dr. B. J. Collingwood[5] devised a method of regulating chloroform percentages by driving air over chloroform. The apparatus is described on p. 67. The apparatus does not appear to have been employed in practical surgical anaesthesia.

Working on similar lines to those suggested by Mr. Harcourt, Dr. Levy[6] constructed a regulating inhaler, fixing his maximum at 3.5 per cent., described on p. 66. Dr. Levy has demonstrated that induction of complete anaesthesia with vapours for 0.5 per cent. to 3 per cent. or 3.5 per cent. is accomplished in five to six minutes and maintained at 2 per cent. or less.

Dr. Waller[7] designed two regulating inhalers. The one—the Wick vaporizer—is described on p. 66. The principle of the second inhaler includes the use of the chemical balance, and is described on p. 67.

Dr. Alcock[8] designed a regulating inhaler, described on p. 67, which delivers accurate percentages of chloroform vapour; percentages up to 3 per cent. were given for induction if that period was restricted to seven or ten minutes, and a lower strength sufficed for maintaining anaesthesia. A series of successful applications of this inhaler in surgical work has been recorded.

The majority of the workers just alluded to have found that 2 per cent. is an adequate percentage for induction; but it should be noted that Snow in his inhaler, Lister in his experiments, Levy and Alcock, have employed a higher percentage, and have regarded 3 per cent. as within the range of safety for ordinary surgical work. The experiments made by Snow, Bert, Dubois, Waller, and the work of the present Committee, have established that percentages of chloroform vapour in air up to 2 per cent. in the cases of both the lower animals and man may, for induction of anaesthesia, be inhaled without danger. Percentages above 2 have been shown not to be safe. The exact dose for safety is, according to Bert, a variable one, but may be taken as lying between 1.5 per cent. and 2 per cent. for induction. It has been shown also that a percentage which lies well within the zone of safety at the commencement of the inhalation becomes dangerous and even fatal if continuously inhaled for a long time. The length of time during which a percentage may be safely inhaled varies directly as the strength or tension of the vapour of chloroform in the mixture, and has to be decided for each individual case.

The regulation of the dosage in the use of chloroform affects the safety of the patient not only during the induction period, but during the period of maintenance and during that of recovery from narcosis. The danger of the induction period has been considered, and evidence has been offered that any dosage above a certain level (that

[1] BRITISH MEDICAL JOURNAL, April 23rd, 1898, p. 106, and *Lancet*, July 9th, 1904, p. 77. The original apparatus was introduced in 1860, but the modification here dealt with was designed by Mr. Krohne, the instrument maker. This is provided with an influx tube to which are attached three elastic balls arranged in sequence, the larger being nearest to the chloroform chamber. These are made of such a size that compressing one or other will pump a certain known quantity—that is, 10, 30, or 60 c.cm.—of air into the chamber. This air passes through the chloroform, escapes by the efflux tube into the face mask, and is inhaled by the patient. The face-piece is open at its summit.

[2] Assuming 17 minims = 1 c.cm. and 1 minim $CHCl_3$ = 0.082 gram, yielding approximately 17 c.cm. of vapour.

[3] BRITISH MEDICAL JOURNAL, vol. i, 1906, p. 615.

[4] See *Soc. Biol.*, 1884, June 14th, and *Mem. Soc. Biol.*, 1885, p. 1. See also *Anésthésie physiologique et ses applications*, Paris, 1894, p. 106.

[5] *Trans. Roy. Med. Chir.*, November, 1904.

[6] *Trans. Roy. Med.-Chir. Soc.*, November, 1906. See chapter on Inhalers, p. 63.

[7] Ibid. Also see chapter on Inhalers; also *Science*, vol. ii, p. 621.

[8] BRITISH MEDICAL JOURNAL, August 15th, 1908, and February 6th, 1909.

is, over 2 per cent.) is unsafe. Early investigators surmised this, and the work of the Committee has confirmed it. The danger of prolonged action of even low percentages of chloroform was recognized by Bert, who regarded death following prolonged chloroform inhalation as due to tissue catalysis. This is explicable, according to modern views, by regarding the first effect of chloroform upon the tissues engaged in nutrition to be that of rendering them unable to carry on their functions, and the prolonged effect to be that of their destruction. Bert and Snow speak of a lethal dose as double that necessary for induction, and even this limit is narrow and easily transcended when chloroform is given in unmeasured percentages. But the term "lethal dose" is, in fact, only applicable to the dosage during the induction period, even if we can accept its use in that restricted sense. When the question of time comes in—that is, during prolonged inhalation—the lethal dose is a sliding one, varying within wide limits. This Snow appears to have recognized[1]: "If animals are kept for a very long time under the deep influence of chloroform [that is, under a dosage safe for induction], they become ultimately exhausted; the circulation and respiration are gradually weakened, and cease nearly together." He noted that increase in the dose given, even when concentrations are gradually changed, produces cessation of respiration; while, when the lungs are suddenly flooded with a high percentage of chloroform, the heart's action is stopped as soon as the chloroform passes through the coronary circulation (see Experiments 24 and 25). He also traced the progressive action upon the central nervous system, showing that deaths arise either from the effects of unduly strong vapours (that is, over 2 per cent.) upon the lungs and heart or as the result of gradually increasing narcotism of the nervous tissue through prolonged inhalation of too great a concentration—a concentration, however, which does not paralyse the lungs or heart, except through nerve interaction. In clinical work we see the effect of prolonged dosing with chloroform. The appearance of a patient who has taken chloroform, especially by a method which is not truly dosimetric, after a prolonged administration, is typical. The face is white, the pulse is soft, small, and compressible, the body and limbs are flaccid, the breathing is soft, respiratory rhythm slow, and the thoracic excursion small. The skin is cold and bloodless. The resumption of consciousness is delayed, sometimes only occurring after an hour or more. After-effects—gastric, renal, or pulmonary—frequently arise, and tissue destruction may even extend to the condition found in cases of acid intoxication. Vagal inhibition usually occurs in the induction period, but may be provoked during operations upon the neck, or the viscera, at a later stage of the proceedings. Clinical experience thus leads us to believe that these dangers are the direct result of over-dosage, and can be prevented by the adoption of an accurate method of giving chloroform in percentages, provided the percentage is varied according to the necessities of the patient and the operation.

It may be claimed, then, that experiment has shown that, as in the case of isolated tissues, so in the case of the intact animal, the immediate effects produced by chloroform are directly in proportion to the dose given—that is, the percentage inhaled—and that the later effects depend both upon the percentage inhaled and the length of time during which it is inhaled. Over-dosage in the induction period produces sudden death; during the period of maintenance death occurs more gradually. When prolonged inhalation has been allowed and a too high percentage has been offered, death may ensue through destruction of the tissues of organs such as the liver, the kidneys, and so on. The Committee accepts the 2 per cent. as the safe dosage for the average adult during the period of induction, but recognizes that clinical conditions, such as the presence of serious lesions or great shock, may render that maximum too high. They can offer no definite limit of safety of dosage in the later stages of maintenance of anaesthesia; but the examination of cases taking definite percentages leads them to believe that extremely low percentages—1 or 0·5 per cent.—are sufficient to maintain anaesthesia, and the employment of higher percentages at this time must eventually prove most deleterious to the patient.

The clinical evidence upon which the above results are based were obtained by the Committee, and are referred to at the conclusion of the following section on regulating inhalers, but it may be noted here that, as shown in the second and fifth reports of the Committee, a considerable number of patients were subjected to percentages of chloroform in air up to 2 per cent. The accuracy of the nominal strengths used was proved as the inspired and expired vapours were examined in a number of cases and the percentage values checked. Anaesthesia sufficient for surgical operations was obtained in adults by a maximum of 2 per cent., in children by a lower percentage, usually 1·5 per cent. Maintenance in these cases was effected by a lower percentage, usually 1 per cent. or less. This result was obtained by employing the Vernon Harcourt, the Dubois, and the Roth-Dräger. In the case of the last two inhalers no quantitative examination of the chloroform in the mixture was made. The results of hospital as well as those of private practice in cases for which the Vernon Harcourt inhaler has been used may be added here to those described in the second and fifth reports of the Committee.

In hospital and private practice over 5,000 cases have been recorded. Besides these a considerable number of patients who were regarded as fitting subjects for ether were rendered anaesthetic by that agent in conjunction with nitrous oxide or chloride of ethyl, and subsequently the anaesthesia was maintained with chloroform by means of the Vernon Harcourt inhaler.[2]

Except very rarely, patients were anaesthetized with vapours up to 2 per cent. When the masks or valves were carelessly manipulated or the administrator was a beginner, the period of induction was somewhat prolonged—ten or fifteen minutes. This, however, is not necessary. Less struggling and fewer minor complications incident to the induction period occur with this method. The increase tube giving a 2·5 per cent. has only been used seldom in hospital, scarcely at all in private practice, and only used to save time. The experience of seven years of hospital work indicates that a 2 per cent. vapour produces complete surgical anaesthesia in practically every type of patient. It does not produce, however, in vigorous subjects an appreciable effect upon the respiratory centre unless the inhalation of 2 per cent. is persisted in for a prolonged period. No deaths due to chloroform—that is, due to strength or quantity of the anaesthetic—have occurred in the hospitals and practice the records of which have been placed at the disposal of the Committee; and, so far as published records are concerned, none appears to have occurred elsewhere.

The following cases of deaths which occurred after the patient had been anaesthetized may be cited, although they appear to have been "unpreventable" from the side of anaesthesia. In them the death took place after the induction period was complete, and was due to surgical causes.

The first was that of a man, aged 51, upon whom a laminectomy was performed. The patient was lying upon his chest and his head hung over the end of the table. Induction of anaesthesia was normal, and 2 per cent. not exceeded. Maintenance was easily obtained as respiration was restricted by the position, and 0·2 per cent. strength vapour was soon reached, and even this was given only occasionally. Haemorrhage was very severe and could not be completely controlled; the patient gradually succumbed to shock before leaving the table. The next case was that of a female, aged 21, who had actinomycosis affecting the tissues below the jaw. An attempt had been made upon a previous occasion to administer ether to her, but the lungs rapidly became choked with fluid, and as the condition was obviously one of danger, the attempt was given up and the operation deferred. On the subsequent occasion she was given chloroform from the Vernon Harcourt inhaler and took it badly. Retching and bilious vomit and profuse bronchorrhoea occurred; 2 per cent. was at no time transcended. When brought into the operating theatre the operation was about to be commenced, when retching and movement occurred and the operation was suspended until these had ceased, and when the conjunctival reflex was lost the operation was pursued. Respiration, however, soon become impaired; the mouth and pharynx were mopped out. In spite of this the

[1] *Chloroform*, p. 109

[2] This method, now commonly adopted in suitable cases, prevents the dangerous after-effects common to prolonged etherizations, but permits the patient the initial ether stimulation, often a great gain.

breathing became worse and the patient, who was in a poor condition, eventually died. The necropsy showed fluid and bilious straining in the air passages and lungs.

The next case was that of a female, aged 31, who suffered from exophthalmic goitre. The anaesthesia was devoid of any abnormal phenomena, and death, which occurred when the thyroid tumour was being drawn from its attachments, was sudden and of the cardiac type, no doubt arising from vagal inhibition. The patient was anaesthetic, but not profoundly narcotized at the time of collapse; 0·5 per cent. was being inhaled.

The next case was of a similar nature. The patient was a man over 60, with advanced heart and renal disease, and he was in a very poor condition. The operation, rendered necessary by his sufferings, was the removal of the prostate, which blocked the bladder outlet. The patient, after being warned that his life would be in grave danger, elected to take his chance. Anaesthesia was easily attained and maintained with a low percentage—0·2 per cent. Manipulation of the bladder caused very grave shock, and as the case was a difficult one, it was impossible to prevent its continuance. The man was quite anaesthetic, but at no time deeply narcotized. As the prostate was dragged out the patient's heart stopped, and respiration failed immediately. As the blood pressure had fallen the strength of vapour given was 0·2 per cent., and this was discontinued before the final catastrophe. In this case oxygen was administered with the chloroform and after the discontinuance of the anaesthetic.

The Committee's experience also shows that after prolonged inhalations the patients take longer to recover, the result probably of higher tissue saturation. When the dosage was steadily decreased during the period of maintenance the recovery was less delayed, and any after-effects—sickness, and so on—were markedly diminished, or even absent. The explanation of this is given in the section on "Physiology of Chloroform."

The ultimate conclusions at which the Committee has arrived with regard to dosage of chloroform may be summed up as:

1. That a 1 per cent. vapour is generally insufficient to induce surgical anaesthesia in an adult, at all events within the limits of time ordinarily available.

2. That a 2 per cent. vapour of chloroform in air is sufficient to induce full surgical anaesthesia.

3. That in pathological conditions, such as depraved blood states, some diatheses, grave pathological states, the safety dose or percentage is below 2 per cent., and must be determined in each case.

4. That the dosage for the maintenance of anaesthesia is of as much importance as that of the induction period, and the neglect of recognizing this has caused many deaths, and constantly delays convalescence.

5. That no definite limit of safety can be fixed for this dose, but that it is in most cases 1 per cent. at first, and must be lowered as time goes on.

SECTION IV.

REGULATING INHALERS AND DEFINITE PERCENTAGES OF CHLOROFORM VAPOUR.

INHALERS DESIGNED TO SUPPLY ACCURATE PERCENTAGES OF CHLOROFORM.

The following is a list of the apparatus designed for giving accurate percentages of chloroform:

Snow's Inhaler.
Charrière's Inhaler.
Duroy's Anaesthesiometer.
Junker's Inhaler.[1]
Clover's Chloroform Inhaler.
Paul Bert's Apparatus.
Dubois's Machine.
Harcourt's Regulator.
Roth-Dräger.
Levy's Inhaler.
Waller's Wick Inhaler.
Waller's Balance Inhaler.
Collingwood's Inhaler.
Alcock's Inhaler.

[1] This inhaler was considerably modified by Krohne and others, and tempts made to render it more accurate as an exact dosage inhaler (see p. 61).

The Committee examined more particularly the Junker, the Dubois, the Vernon Harcourt, and the Roth-Dräger apparatus.

Snow's Inhaler (1847).[2]

The inhaler is made of metal, consists of a double cylinder, the outer space of which contains cold water, the inner serves as an evaporating chamber for the chloroform. Into the inner part of the cylinder is screwed a frame, having numerous openings for the admission of air, and four stout wires which descend nearly to the bottom of the space, and are intended to support two coils of stout bibulous paper, which are tied round them and reach to the bottom of the inhaler. In the lower part of this paper four notches are cut to allow air to pass. The quantity of chloroform which is put in should never fill the apertures or notches; the air which passes through the inhaler meets with no obstruction whatever. A glass tube communicating with the interior of the inhaler allows the administrator to see how much chloroform is left. An elastic tube with a $\frac{3}{4}$ in. internal diameter carries the vapour to the face-piece. This last has expiration and inspiration valves, and the former is arranged so as to be displaceable laterally, thus permitting entrance of air to dilute still more the chloroform vapour given by the inhaler. It thus appears that although the inhaler presented a possible 5 per cent. of vapour as a maximum it provided ample means for lessening this dose. This maximum is undoubtedly highly dangerous, and Snow's success was due no doubt to the movable valve and his personal experience. Of the fifty deaths under chloroform of which Snow gives details, three—namely, Nos. 41, 44, and 45—occurred when Snow's inhaler was being employed. A water bath at room temperature was employed to counteract the cooling of the chloroform due to evaporation and to ensure continuous and equal evaporation of the chloroform. Snow arranged the bibulous paper in the inhaler "to contrive that the air passing through, in the ordinary process of inhalation and at the ordinary temperature of 60° F. should take up 5 per cent. of vapour." The quantity can be diminished as much as is desired by turning the expiratory valve of the face-piece a little to one side. Two to two and a half fluid drachms of chloroform were placed in the inhaler at first.

Charrière's Inhaler.

This inhaler, formerly much used on the Continent, depends upon the physical law of evaporation from a given area of a surface exposed to a current of air.

The apparatus supplied only very approximately any desired percentage, and has passed out of use.

Duroy's Aesthesiometer.

This permitted a certain number of drops of chloroform to fall upon an evaporating surface. The number of drops was under the control of the administrator. If, as Snow points out, 60 drops, which weigh 20 grains, fell per minute and produced 15·3 cub. in. of vapour, and mixed with an average adult's breathing of 400 cub. in. per minute, the air breathed would contain 4 per cent., but if the breathing were slow or feeble, or if the breath was held, the inspired air would rapidly become charged with a dangerously high vapour of chloroform. Rapid breathing, on the other hand, would lead to inspiring an inadequate percentage of vapour.

Clover's Inhaler.

Clover's inhaler[3] consisted of a bag of known capacity and lined with goldbeater's skin. A metal box kept warm by water containing blotting paper had in its lid an aperture into which a graduated syringe was fixed, and this permitted the introduction of a known quantity of liquid chloroform into the receptacle. The box was connected on one side with the bag and on the other with a foot bellows pleated like a concertina. Air was pumped through the metal receptacle and took up the chloroform in vapour and passing on filled the bag. This last was then detached and hung upon the back of the anaesthetist. Any percentage was thus obtained. Clover used 40 minims of chloroform to 1000 cubic inches of air, that is, 4·5 per cent. The facepiece was connected with the bag by tubing, and was fitted with valves made of ivory supported on springs.

[2] *On Chloroform and Other Anaesthetics*, 1858, p. 82.
[3] *Lancet*, 1864, vol. ii.

The manipulation of these valves really regulated the percentage value of the vapour received by the patient, so that the safety of the inhaler depended upon the personal skill of the person who employed it. As in the case of Snow's inhaler, so in that of Clover's, the nominal maximum percentage was never allowed to reach the patient's lungs. This inhaler was constructed on the "draw through" system, but, as has been pointed out, it was liable to variations of percentage owing to failure of the proper mixing of the air and chloroform vapour. Clover's plan appears to have been to supply a maximum and dangerously high tensioned vapour, the strength of which he diminished by opening the valves in his face-piece. This method, even in his expert hands, proved to be not devoid of danger, and failed because it gave no definite indication either of the real strength of the air and chloroform mixture in the mixing chamber, and none of the actual strength of vapour which the patent inhaled. The method appears to have fallen entirely into desuetude. Some accidents occurred during its use.

Paul Bert's Apparatus.

Bert's method of *mélanges titrés* applied to human beings was carried out by using large gasholders for mixing the chloroform in air; a definite percentage of 1.6 was employed. The apparatus was designed by M. St. Martin.

Junker's Inhaler (Present Form).

In the section referring to dosage the value of this inhaler is discussed, and, as Waller and Chapman have shown, it cannot be accepted as reliable, except under the most rigid conditions, which are seldom, if ever, attainable in giving anaesthetics for surgical operations. In 1903[1] the Committee examined this inhaler, and came to the conclusion that, although under favourable conditions it might deliver a safe percentage—that is, one below 2, yet in practice it could not be relied upon to supply such a vapour. For, independently of the physical laws controlling the evaporation from the chloroform in the bottle, there are always two uncontrollable sources of danger—irregular working of the bellows, and the variations in the breathing of the patient inspiring the mixture of chloroform vapour and air. The variation in the rate and force in the use of the hand or foot pump influences the percentage value of the mixture, and the rate of breathing, unless the face mask is supplied with open valves admitting air very freely, may produce a percentage of 5, or even more.

The apparatus is too well known to need description in detail. The Committee regard the chief objections to the Junker method to be that (1) the administrator has no means of knowing what percentage vapour he is giving, and (2) that the apparatus is capable of supplying dangerously high percentages of chloroform vapour, and may do so without the anaesthetist being aware of the fact. Indeed, the percentage can only be kept within safe limits by the most sedulous care even by an administrator of experience. Many fatal accidents have occurred during the use of the method, due either to overdosage or to faulty arrangement of the component parts of the apparatus.

The modern forms of the inhaler are safer in many ways than the older ones, but as the principle is the same, they are all open to objection. It should be noted that a Junker's bottle worked by a motor, so that a definite quantity of air enters by regular strokes of the piston, is an absolutely different apparatus from that which is controlled by a hand or foot bellows. In the last case, splashing and irregular passage of varying quantities of air must occur. Of this the Committee are confident, and in this lies the danger of the method.

Dubois's Machine.

The Dubois chloroform machine[2] is a plenum inhaler, and consists of a pump which is worked by the hand or foot. The piston forces a definite volume of air with a measured quantity of chloroform into a mixing chamber. The chloroform is delivered automatically into a small receiver which is kept at an even temperature by a spirit lamp. As soon as the receiver is filled the descent of the piston empties it into the evaporating chamber, and the piston rising, fresh chloroform flows into the receiver. The percentage value of the vapour depends upon the amount of chloroform and the volume of the air mixed at each descent of the piston, and the accuracy of this has been abundantly proved by the inventor and by estimations made in this country by Waller, Chapman, and others. The machine is usually constructed to deliver percentages up to 2 per cent, although by an additional arrangement 3 per cent. can be secured. Dubois, however, found that a strength of 1 6 per cent. sufficed in most cases to produce anaesthesia, and 1.2 per cent. to maintain it if the operation is a long one. He stated that seven to ten minutes is the time required for the production of anaesthesia.

Operations on the mouth, larynx, pharynx, etc., necessitate replacing the ordinary face-piece by a mouth or nasal tube, and the mixture is pumped through it into the air passages.

Dubois's apparatus is admirable for hospital work, and has been extensively employed abroad. In this country Dr. Chapman has demonstrated its value, and published a record of ten years' work without any danger or difficulty. Waller, who has given demonstrations in London hospitals with the Dubois machine, regards it as highly satisfactory. Its size and weight render it less adapted for routine medical practice, while its high price presents a further drawback to its general adoption.

The examination of this apparatus made by the Committee led them to accept it as one of the best of the plenum inhalers; but they regarded its size, bulk, and price as prohibitive, and they therefore sought for a simpler, cheaper, and more portable means of providing an apparatus which any medical man could employ.

The Vernon Harcourt Inhaler.

This inhaler possesses the advantages of simplicity, exactness, and portability, and therefore appears to be well adapted for universal employment. The Committee adopted it in their experiments.

The Harcourt inhaler[3] provides, in sufficient quantity for full and free respiration, a mixture of air and chloroform which is automatically limited to a maximum strength of 2 per cent., and this can be diluted at will with additional air down to any smaller proportion.

The two-necked bottle is filled with chloroform to near the top of the conical part, and two coloured glass beads are dropped into the liquid to indicate when the temperature is within the range 16° C. and 18° C. If the temperature of the chloroform is below 16° C. both the coloured beads will float; if it is above 18° C. both will sink; in the former case the proportion of chloroform inhaled will be less than the pointer of the stopcock indicates; in the latter case it will be greater. The proportion is also increased by any agitation of the bottle. During inhalation the chloroform is cooled by evaporation; its temperature may be kept between 16° C. and 18° C. by now and then warming the bottle by holding in the hand till the blue bead has sunk and the red bead is beginning to sink. The dimensions of the bottle have been arrived at after a great deal of experimental work and careful analysis. The diameter of the upper portion has been proportioned to the average rate of human respiration and to the rate of evaporation of chloroform between 16° C. and 18° C. To compensate for varying rates of respiration the inlet and outlet of the bottle are placed near together and at some distance from the surface of the liquid; while to compensate for the lowering of the liquid surface by evaporation the vessel widens as the surface of the chloroform descends, thus increasing the area of evaporation. The nearness of the two necks one to another, and the distance between them and the surface of the chloroform, diminish the variation in the proportion of inhaled air to chloroform vapour which is caused by unusually shallow or unusually deep breathing. When the flow of air is gentle, much of it passes in at one neck and out at the other without reaching the surface of

[1] See Committee's Second Report, Paper III, BRITISH MEDICAL JOURNAL SUPPLEMENT, July 18th, 1903.

[2] *Anésthésie physiologique et les applications*, par le Dr. Raphael Dubois, Paris, 1894, p. 108.

[3] See Appendix (Committee's Second Report, Paper II; Third Report, Appendix II, BRITISH MEDICAL JOURNAL, July 18th, 1903, and July 23rd, 1904), for the scientific data upon which depend the construction and accurate use of the regulator.

the chloroform or displacing wholly the mixture of air and chloroform which occupies the upper half of the bottle. On the other hand, the strong current caused by deep breathing drives out all the vapour which has been formed, and promotes further evaporation by stirring the surface of the liquid. If the rate of breathing is voluntarily reduced to 3 litres a minute instead of 7 litres, or raised above this, the proportion of chloroform may be raised to about 2.5 or lowered to about 1.5 per cent. By lengthening the cylindrical part of the bottle it would be possible to correct more completely for variations in the rate of breathing; but two ratios have to be considered in judging of the probable effect upon a patient—that of chloroform vapour to air, which is lowered by larger breathing, and that of the mass of chloroform inhaled to the mass of the body through which it is distributed, which is increased. Further, the increase of absorptive lung-surface, with deep breathing, is balanced by the diminished proportion of chloroform and vice versa.

The stopcock is so made that when the pointer is at the end of the arc nearest the bottle of chloroform the maximum quantity is being administered—namely, 2 per cent. When the pointer is at the opposite end only air will be inhaled; and when it is midway, dilution of the 2 per cent. mixture with an equal volume of air will make the proportion 1 per cent. The shorter lines on either side indicate intermediate quantities—namely, 0.8, 0.6, 0.4, 0.2; and towards the chloroform bottle, 1.2, 1.4, 1.6, 1.8.

The valves in the glass chambers on the top branches of the inhaler prevent the entrance into the apparatus of expired air, and also serve to show whether the stopcock is working rightly. Only one valve opens when the pointer is at either end of the scale, both equally when the pointer is midway, and for all other positions one valve opens more and the other less, in the degree indicated by the position of the pointer on the scale. The movement of these valves shows also how full and regular the breathing is, and the slight click which they make conveys this information to the ears, and so obviates the necessity of constantly looking at the apparatus.

It is generally found that beginning with the pointer at 0.2 and moving it on towards the chloroform bottle at the rate of one division about every half-minute up to 1.6 or 1.8 produces narcosis as quickly as is desirable. Unless the patient is a child or is unusually sensitive to the vapour, time may be saved by passing from a 0.2 per cent. in a breath or two to 0.5 per cent., then in half a minute to 1 per cent., and so on to 2 per cent. Induction usually occupies six minutes for adults, less for children. Stout, vigorous, and alcoholic persons may take longer to become completely anaesthetized, but as a rule failure to induce anaesthesia within a reasonable time arises from the mask not fitting accurately, so that the patient does not get a full 2 per cent.

For the maintenance of narcosis a dose of 1 per cent. or even less is sufficient. The stopcock can be moved by a touch of the finger so as at once to increase or diminish the dose.

If by the fall of temperature or agitation of the bottle the yield of chloroform is diminished or increased, this may be allowed for at once by a movement of the stopcock.

The face-piece, which is provided with an expiratory valve, and can be fixed in any position, is either attached directly to the inhaler, which in this case is held in the hand, and should be kept as nearly vertical and as steady as possible, or can be connected by about 20 inches of half-inch bore rubber tubing; the inhaler in this case being supported on a stand or hung on to the back of the bed or from a strap going round the neck of the administrator.

The mask is made of solid toughened rubber, fitted with a rubber air-cushion. It can be washed, or boiled, and as it becomes plastic in hot water the shape can easily be modified, if required, so as better to fit the patient's face.

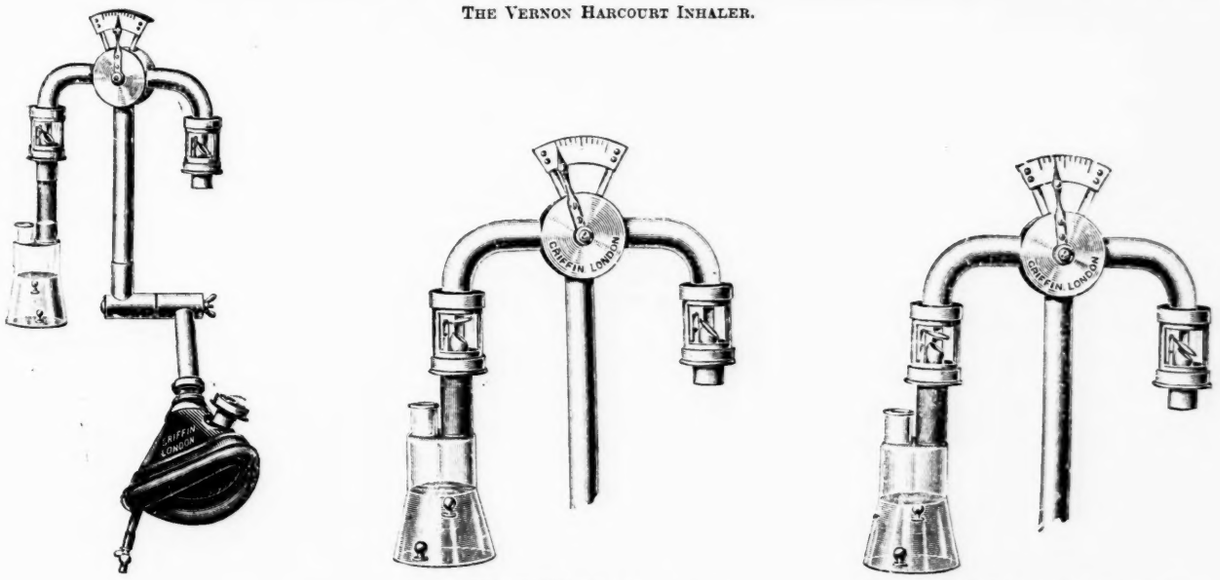
No chloroform evaporates excepting that which is inhaled by the patient; and only that which is exhaled passes into the air of the room. There is, therefore, but slight chance of the formation of hydrochloric acid and phosgene gas when the inhaler is used in a room in which gas or lamps or candles are burning.

If, as in hot weather, the temperature of the chloroform rises to above 17° C., both pink and blue beads sink, and the percentage delivery will be slightly above that indicated. This rapidly corrects itself as the increased evaporation cools the liquid. Of course, the administrator can by slightly shifting the indicator effect the required correction of 0.2 per cent. or 0.3 per cent.

The inhaler has been now in regular use in University College Hospital, the Hospital for Paralysis and Epilepsy, Queen Square, and elsewhere, for seven years, and several thousands of cases have been carefully recorded. There have been no deaths. The experience has shown the inhaler to fulfil its object very satisfactorily. (See page 62.)

For a detailed account of the use of this inhaler see Appendix, p. 69.

THE VERNON HARCOURT INHALER.



Pointer adjusted to give 2 per cent.

Pointer adjusted to give 1.4 per cent.

The Roth-Dräger Apparatus.

This is capable of supplying a dosimetric system of chloroform inhalation; it possesses a further advantage in that it mixes the chloroform vapour with oxygen. Dr. Hagen's[1] description has been followed in the account of the apparatus which is here given, except for the omission of any reference to the concurrent use of ether as suggested by Professor Krönig. Chloroform is placed in a glass vessel so arranged that when the stream of oxygen is turned on a definite number of drops of the

[1] *Muench. med. Woch.*, No. 20, May 15th, 1906.

anaesthetic fall in a unit of time into an evaporating chamber. The amount of oxygen is under control, so that the percentage of chloroform vapour is capable of being regulated. The percentage value is recorded upon a dial, being estimated as corresponding to the number of drops volatilized. The oxygen and chloroform vapour are carried by a tube to a metal face-piece which fits the patient's face. This face-piece is provided with expiratory and inspiratory valves of mica; the latter prevents fouling of the oxygen with exhalations; the excess of oxygen passes into a spare bag, and there is a permanent opening admitting air. It is estimated that the patient receives 4 litres of oxygen and 8 litres of atmospheric air per minute. The spare bag receives the oxygen and narcotic vapour during the expiration, and empties during the next inspiration, so preventing waste. The apparatus, although looking formidable, is easily worked. It was tried for operations at University College Hospital, and was found satisfactory. A smaller portable form is constructed, but it is necessary to convey a large cylinder of oxygen for its use, and so this admirable apparatus fails as a really portable means of supplying an accurate percentage of chloroform.

Over a thousand cases in which the Roth-Dräger instrument was used abroad have been recorded, and during these some fatalities occurred. These are not given in detail, and probably arose through excessive dosage, since no definite limit of strength appears to be set during its use, and the apparatus can supply high percentages if the administrator chooses to employ them. Using a 2 per cent. vapour, the results obtained were very good.

Levy's Inhaler.[1]

The main principle involved is the suction of air over a surface of chloroform by the respiration, and the dilution of the mixture of air and chloroform vapour thus obtained by such a further proportion of air as may be desired before it reaches the respiratory passages.

The evaporating chamber is annular in form. At one point it is intersected by a vertical radial diaphragm, and in the top, to one side of this, a short air inlet tube is attached, and on the other side a similar outlet tube.

The chamber is made of thin copper, and it forms part of the cover of a larger vessel of about a litre capacity. This latter is filled with water at 20° C., and serves as a water-jacket to regulate the temperature of the chloroform. The chloroform chamber is connected with the regulating valves and face-piece by means of a length of aluminium pressure tubing.

The tube is connected at its further end directly to a brass mounting, which contains a circumferential air slot, which may be covered up to any desired extent by a revolving collar. This device is termed the "compensator." This mounting is screwed on to the tubular valves which constitute the regulator. This consists of two concentric cylinders fitted one within the other, the inner of which can be made to revolve within the outer by moving a lever. The cylinders contain reciprocally-acting apertures, one leading from the chloroform chamber, the other communicating direct with the air. When either is partly open the other is shut in the same proportion. Thus the chloroform may be diluted to any desired extent.

The lever before mentioned carries an index hand which travels over a scale indicating percentages of vapour. This scale was plotted out by means of a series of experimental estimations.

The air passes from this regulating apparatus through a glass valve chamber in which is registered the strength of the inspirations by measuring the swing of a hinged inlet valve constructed of mica. The hinge is made of oiled silk, and the necessary elastic resistance supplied by a length of thin, spirally-coiled, manganin wire. The swing of the valve is measured off on a curved index engraved with marks denoting various degrees of force of inspiration.

A curved metal tube connects this chamber to the face-piece, into one side of which is inserted a spring valve, which opens during expiration.

For aspirating air through the apparatus natural respiration through the face-piece is resorted to, voluntarily controlling the inspirations to the various grades of strength marked on the valve scale, and thus the experiments were performed under conditions such as occur in actual practice.

The marks on the valve scale correspond to the following velocities:

4	equals	860 c.cm.	per second	(forcible breathing)
3	,,	660	,, ,,	(strong breathing)
2	,,	460	,, ,,	(moderate breathing)
1.5	,,	310	,, ,,	(weak breathing)
1	,,	220	,, ,,	(very weak breathing)

The important differences in the percentage of vapour corresponding to the various velocities of the air current have been combated and brought to a common reading by means of the adjustable slit styled the compensator. But it is only necessary to employ this in the series of high percentages—2.5 per cent. and over. At lower percentages than this the compensation is carried out automatically by reason of the viscosity effects upon the air currents in the long connecting tube affecting more powerfully the low-pressure currents. A certain amount of overcompensation is unavoidable in the case of very faint aspirations of about 200 c.cm. Such a weakness in strength of breathing should as far as possible be avoided.

At the 2.5 mark and over the automatic compensation progressively fails, and the compensator has to be used.

In use anaesthesia may be completely induced by this instrument in five to six minutes, proceeding gradually from a 0.5 per cent. mixture to a 3 per cent. or 3.5 per cent. When narcosis is complete the regulator is at once put back to the 2 per cent. mark, and is subsequently manipulated according to clinical indications. One—the most important of these evidences—is the respiration; and a complete account of this function is rendered by the action of the valves. Dr. Levy has published a series of cases of anaesthesia produced by his inhaler.[2]

Waller's Inhalers.

Dr. Waller has devised two forms of plenum inhalers; in both cases the air is driven into a mixing chamber by foot bellows or by a motor, but the methods of regulating the percentage of the mixture differ. These inhalers are respectively the Wick Inhaler and the Balance Inhaler, and they may be briefly described as follows:

(A) The *Wick Inhaler* is based upon the plan adopted in certain makes of motor cars of evaporating required quantities of petrol by means of wicks of known size and heating power. This applied to chloroform is obviously simple. The mixture is led from the mixing chamber to a face-piece.[3]

"The apparatus consists of a three-wick lamp containing liquid chloroform to be sucked by the wicks, and vaporized in the mixing chamber, into which air is pumped by an ordinary foot bellows as used by glass-blowers.

"The volume of air supplied by the bellows is determined by an appropriate stop, of which the orifice has been adjusted to give with the bellows reservoir at ordinary tension the desired volume of air per minute—12 to 15 litres in the case of the human subject.

"The volume of chloroform vapour taken up by the air is determined by the area of wick exposed and the volume of air supplied to the mixing chamber—in the case of the human subject a wick area of 100 cm. obtained by turning up two of the three wicks was found to give a mixture of about 2 per 100, with an air supply of 10 to 15 litres per minute.

"The face-piece, in the case of the human subject, need not be closely applied, and is provided with orifices of overflow, the principle aimed at being to supply to that face-piece a constant flow of chloroform and air in liberal excess of the normal volume of inspired air."

(B) *Balance Inhaler.*[4]—Air is pumped by a small electric motor through an ordinary wide-mouthed bottle containing liquid $CHCl_3$ into a large mixing chamber of 30 litres capacity, containing the $CHCl_3$ balance and provided with an inlet from the $CHCl_3$ bottle supplying the mixture, and an outlet to the tube and face-piece. The flow of air is rendered uniform and of suitable volume per minute by means of an elastic reservoir and a perforated stop on the

[1] Described originally in *Trans. Roy. Med. Chi. Soc*, 1904-5, and *Lancet*, November 26th, 1904, p. 1496. A slight modification of the inhaler is described in the *Lancet*, May 27th, 1905.

[2] *Trans. Roy. Soc. Med.*, vol. ii, 1909.

[3] *Trans. Roy. Med. Chir. Soc.*, vol lxxxviii, p. 685 et seq.

[4] *Science Progress*, vol. ii, 621.

course of the supply tube. The percentage of the mixture is watched on the pointer attached to the beam of the balance, the point of which travels over the scale. From one end of the beam hangs a large sealed glass bulb and from the opposite end hangs a counterpoise. When the balance case contains air only the counterpoise is slightly the lighter of the two, and the index points to 0 at one end of the arc over which it moves. When the mixture of air and chloroform passes into the balance case, the bulb being far larger than the solid metal counterpoise and therefore displacing more of the gas around, it loses more of its weight when the density of the mixed gas increases, and therefore the index moves over the arc to a position which is determined by the density of the mixed gases. The arc is graduated at intervals of 0.2 per cent. and figured at the points corresponding to 1, 2, and 3 per cent.

The percentage is regulated by varying the depth of a tube in the chloroform bottle and by admitting more air into the mixing chamber. The chamber can be placed at any distance from the patient, the mixture being carried to the face-piece by means of a tube. As the inhaler is made on the plenum system no respiratory difficulty arises through the length of this supply tube. A slight addition to the machine can be made by which a permanent record can be made of the strength of the vapour given throughout the narcosis.

Both these inhalers have been employed in some cases for surgical anaesthesia, and with success.

In their present form, however, they are hardly applicable for everyday surgical use. The accuracy of their delivery has been tested, and it has been demonstrated that the nominal percentage can be maintained with some degree of accuracy.

Collingwood's Inhaler.

Dr. B. J. Collingwood[1] has described his method as follows: The method consists of drawing air up an inclined tube down which a fine stream of chloroform is constantly running. There are a series of inlets along this tube which can be opened or closed at will. The amount of chloroform taken up by the air is regulated by opening one or other of these inlets. In this way the air is made to pass over a longer or shorter stream of chloroform. The inclined tube ends in a vessel which receives all the chloroform which has not been vaporized.

The air is sucked in by two pairs of bellows which act alternately. Each pair of bellows is connected with inlet and outlet ball-valves. The inlets of these valves are in communication by a T-piece with the inclined tube, the outlets in a similar manner leading to the delivery tube.

The bellows are worked by a horizontal shaft, on which two cams are fixed, which close the bellows alternately. These cams are of such a size that one or other of the bellows is always being closed.

The opening of the bellows is brought about by weights attached to the handles. Thus the bellows opens independently of the turn of the shaft, and always at the same rate. That the rate of opening should be constant is a very important point, for any variation in the rate of intake current would of necessity produce a variation in the percentage of chloroform vapour.

In addition to the handle, the operating shaft is provided with a grooved wheel, so that the apparatus can be worked either by hand or by motor.

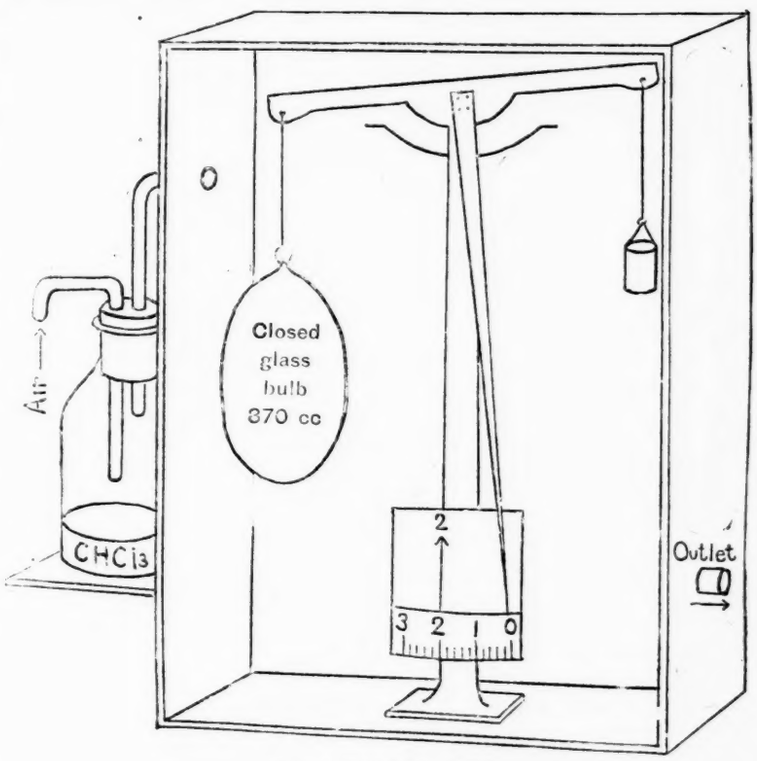
The stream of chloroform enters the inclined tube by a siphon tube, whose upper end dips in a Mariotte flask containing chloroform. It was found that if a Mariotte flask was not used a rise of chloroform level in the flask of 3.5 cm. caused a rise of percentage of chloroform vapour from 1.55 per cent. to 1.75 per cent.

Variations in the percentages delivered arise when the rate of turn of the handle occurs. These variations can be explained by the fact that the longer pause there is between each intake of the bellows, the longer time is given for chloroform to accumulate in the tube.

Alcock's Inhaler.

This inhaler[2] is a further example of a plenum inhaler, and, as it has been used with considerable success in hospital practice, may be described fully.

It consists of a circular copper vessel, 5 in. in diameter and 4½ in. deep, which contains 150 c.cm. of chloroform; 1¼ in. from the bottom is fixed a shelf, closed, except for two oblong holes. Immediately above and touching this shelf is a circular plate, movable by means of a hollow rod in the centre, and pierced by two triangular apertures. These can be adjusted by the centre rod, so as to expose more or less of the fixed oblong holes in the shelf, and so produce greater or smaller openings into the space below. Air (supplied by a foot bellows or from an electric fan) enters the chamber by one tube opposite one aperture and leaves by another tube opposite the other, taking up more or less chloroform vapour, according to the size of the apertures. The temperature of the chloroform is read from a thermometer in the hollow rod, and the chamber is surrounded by a water-jacket. The apparatus was tested, and variations from the nominal value of the vapours delivered were slight. It allows percentages of chloroform vapour up to 3 per cent. With its use in hospital several cases required this high percentage. Dr. Alcock remarks



Dr. Waller Balance Inhaler.

> If it is desired to induce anaesthesia in from eight to ten minutes, the ordinary adult must be given percentages rising to 2 per cent. in two minutes, then to 2.5 per cent. in three minutes. This amount usually will suffice. There is no objection to raising the percentage to 3 per cent. in five minutes (*not sooner*), if it is required, *provided due care is exercised*.

The italics are those of Dr. Alcock, and the closing line of the quotation appears to contradict the statement that a 3 per cent. may be used with absolute safety, as the words used imply danger if a 3 per cent. vapour is employed—a danger calling for the exercise of care, and that there is grave danger if such a vapour is used early in the induction period. The apparatus tested clinically appears to have been a success as far as the present experience gained with those patients upon whom it was tried permit us to arrive at any definite judgement.

[1] *Trans. Roy. Med. Chi. Soc.*, vol. lxxxviii, p. 695 et seq.

[2] BRITISH MEDICAL JOURNAL, August 15th, 1908, and February 6th, 1909.

SUMMARY OF FACTS GOVERNING THE ADEQUATE AND SAFE DOSIMETRIC ADMINISTRATION OF CHLOROFORM.

Many circumstances have to be considered in selecting the best form of chloroform inhaler to obtain accurately a given dose of chloroform. The necessity for simplicity and portability of the apparatus has to be taken into account, as well as the absolute accuracy of the system controlling the strength of vapour supplied. A further and imperative requirement is that the apparatus shall be under the control of the administrator, and he shall be able to increase or decrease the strength of the vapour according to the exigencies of the patient and the nature of the operation in progress. It is also essential that there shall be some easily seen index of the strength of vapour which is being given to the patient.

The apparatuses of Snow, Clover, and of their era are too inexact and cumbersome; the Junker inhaler is open to the first of these objections.

Bert's method of *mélange titré*, in which large gasholders are necessary, is clearly only applicable for use in hospitals. All inhalers fall into one or other of two classes. In one a definite mixture of known chloroform value is presented to the patient by the following means: Air is driven either through or over liquid chloroform and delivered to the patient, who breathes it as an atmosphere. This is the plenum system. In the other method the patient draws the air by his own respiratory efforts through an apparatus. Breathing from a plenum possesses some advantages. The members of the Committee, after large experience, found that provided the length and calibre of the tube through which patients had to breathe were adequate, no respiratory difficulty occurred with the Harcourt type of inhaler, and that there is neither disability nor detriment. They also found that to use a plenum inhaler a motor or assistant is needed to work the pump. Under ordinary conditions, such aid is not possible in a hospital, much less in private practice. On the other hand, there are many actual advantages in making use of the patient's respiratory power for inspiring an anaesthetic. Its variations are required as a guide, and such variations are more easily recognized in the use of the "draw-over" system than in that of the "plenum." Of the plenum inhalers the Dubois is one of the best. In hospital work it is accurate, and its use easily mastered, although it is like all mechanical inhalers, somewhat complex and too heavy for general or emergency use. The other plenum inhalers also suffer from the complexity of their mechanism and their lack of portability. The Committee tested the Vernon Harcourt regulator, and found it reliable as well as portable. The anaesthetist who uses it can see what strength of vapour the patient is receiving, and can readily alter the percentage.

In the Committee's Second and Fifth Reports are given details of cases in which this inhaler was used, and in their Fourth Report (July, 1905, Appendix II) is described the testing of the accuracy of the delivery by the inhaler for various types of respiration. After preliminary testing the inhaler was employed in St. Thomas's Hospital[1] by Mr. Tyrrell, and in University College Hospital[2] by a member of the Committee. The trials were satisfactory, and subsequently a large number of patients in hospital and private were anaesthetized by its use.[3] Students readily learnt to use it, and with success. The initial difficulties arising from variation in rate and force of breathing were entirely removed by modifications in the size and shape of the two-necked chloroform flask. Splashing of chloroform was not found to occur in practice unless as the result of great carelessness. In the early days of its use splashing did occur on a few occasions but no serious results followed. Induction was found by these observers to take about six minutes, and if delayed it usually arose from failure to make the mask fit properly. The graduation of the apparatus and the strength of vapour it is made to supply are, of course, matters controlled entirely by physical laws. The maximum of the percentage delivered could be of whatever value the Committee decided. But the terms of the extended reference required that they should fix upon a maximum which is sufficient "to produce full surgical anaesthesia without permitting any risk to the person inhaling." Such a maximum had been stated by Snow and Bert and Dubois to be below 2 per cent. This refers, of course, only to risk of overdosage by chloroform.

The work of the Committee was therefore directed to answer the two questions: (1) Is a 2 per cent. vapour of chloroform sufficient to produce full surgical anaesthesia? (2) Is a 2 per cent. vapour of chloroform in air a safe strength to use in routine practice?

The first question could only be answered by clinical observation, and the results arrived at were in complete accord with those of Snow and Bert, namely, that a percentage of 2 of chloroform vapour eventually induces complete surgical anaesthesia in all subjects. Dr. Waller has insisted in recent years that the 2 per cent. vapour of chloroform in air should be adopted as a maximum, and with this view the Committee agrees. That patients should differ in their reaction to such a percentage of vapour was to be expected. The patients who habitually "take chloroform badly," such as the victims of alcohol, required more prolonged periods of inhalation than others. Persons who breathe in a very shallow way, and so give poor lung ventilation, also take longer to anaesthetize; such patients are commonly nervous or neurotic. Children and asthenic subjects needed shorter periods of inhalation, and could be completely anaesthetized with percentages below 2, but the average individual required the full 2 per cent. vapour.

The answer to the second question needed more prolonged examination, and could only be arrived at when experiments had been made elucidating the effects of chloroform upon the different structures of the body—the nervous system and nerve tissues, the heart and blood vessels, the myocardium, muscular and nervous elements; blood, unstriated muscular tissue, glands, and so on. The reports of the Committee indicate the work done in these directions, and the results obtained are given fully in the section on the physiological effect of chloroform (p. 50).

The members of the Committee have now had large experience, and have found that in induction of anaesthesia there is no danger of chloroform death when percentages gradually rising to 2 are employed. Sufficient proof of this statement is advanced not only by previous observers but by the fact that no death is known to the members of the Committee to have occurred during the induction of anaesthesia by means of the Harcourt inhaler; whereas it is a matter of common knowledge that the induction period is fraught with grave danger, and many deaths have occurred during it when non-dosimetric methods have been employed. Vagal inhibition, which has been shown to constitute one of the greatest, if not the greatest, peril incident to the induction period of chloroform narcosis, has not been found to occur when less than 2 per cent. is inhaled, but is always liable to occur and cause death when a vapour of over 2 per cent. value is breathed. It was found, also, that the fall of blood pressure—the usual active source of danger, since it determines loss of the necessary blood supply to the nervous system and heart—does not go beyond a safe degree of declension provided 2 per cent. is not exceeded nor continued after the required degree of narcosis has been attained, but rapidly reaches a dangerous limit with the use of higher percentages.

The effects of various percentages of chloroform vapour upon blood pressure have already been considered.[4]

The dangers due to struggling are minimized with percentages below 2, as muscular contractions are seldom marked with low vapour values, and struggling is infrequent. The absence, when low-grade vapours are inhaled, in most cases, of sickness, headache, and the other symptoms of chloroform toxaemia, leads the Committee to believe that cases of so-called delayed chloroform poisoning are less liable to occur.

The Committee found that the time required for induction varies in different subjects, being determined by very many factors besides the rate of entrance of chloroform vapour. As the continued administration of chloroform vapour at the value of 2 per cent. after induction is complete leads to deepening of the narcosis, and as lower percentages, such as 1 per cent. or even 0·5 per cent., according to the case, are sufficient to keep up anaesthesia, the prolonged administration of 2 per cent. is unsafe. In very prolonged operations, such, for example, as those which last over two hours, persistence in the use of a 2 per cent. would be quite unnecessary as well as dele-

[1] Committee's Second Report, Paper V.
[2] Ibid., Paper IV.
[3] See Section III, p. 56.
[4] See Section II, p. 50.

terious. When an apparatus is used which allows the administrator to lessen the strength of the vapour inhaled at will it is easy to avoid excessive dosing, and the percentage vapour requisite for any case can readily be discovered and as readily applied to the patient.

As prolonged inhalation of even 2 per cent. vapour induces gradual lowering of blood pressure with the associated conditions of weakened heart action and fall of the body temperature, even though the fall of blood pressure is slow and the immediate effects may not appear to be serious in most cases, the Committee suggest that the safety limit for adults for induction should be 2 per cent., and that this percentage should be lowered at the end of the period of induction. In some persons persistence of muscular spasm over painful areas, for example, in the right hypochondrium in cases of appendicitis, may necessitate a more prolonged use of a 2 per cent. vapour than is usually required. Such muscular rigidity is commonly due to tissue asphyxia, and is best overcome by giving oxygen *pari passu* with the chloroform.

The Committee determined to accept the 2 per cent. vapour of chloroform as a sufficient maximal dose for adults during the induction period, and therefore suggested that limit as the maximum on the scale of the Vernon Harcourt inhaler. To exceed this, they are convinced from their experiments and from the study of those who have made researches upon the question outside the Committee, is dangerous for patients. Whether the risk must be run in some exceptional cases, such as in high abdominal operations, is outside the reference of their enquiry. If higher percentages are employed—and Levy, Alcock, and others assert a 3 per cent. is often required for induction of anaesthesia—their use must be undertaken only with a due recognition of their danger, and after careful weighing of all the facts to determine whether the exigencies of the case justify the increased risk to the patient.

The chief danger of non-dosimetric methods lies in their adoption by persons who have had little experience in anaesthetics and who are unable to guess at the strength of vapour they are using even if they realize that safety or danger with chloroform is ultimately a question of a sufficient or too high a percentage vapour.

It has been alleged that the use of a closed inhaler is dangerous, as it interferes with respiration and unduly curtails the patient's supply of air and imposes extra respiratory labour.

These points were considered by the Committee at the commencement of their work.

It is undoubtedly true that to interpose any length of narrow tubing between the mouth and the source of air supply must impose increased labour in breathing. This is obviated by using a wide and short connecting tube as has been observed in patients who have respired from a Vernon Harcourt inhaler. One member of the Committee has had the opportunity of enquiring from patients, in many cases from medical men, whether any dyspnoea existed, and the answer has been in the negative.

To test this matter further, more than one member of the Committee have actually taken chloroform by this method, and they confirm the above statement.

Dangers arising from falling back of the tongue, the status lymphaticus, Graves's disease, blood or mucus in the air passages, escape of pus into the lungs from an empyema, or what not, are matters which have nothing to do with a particular apparatus; they are incidental to anaesthesia, and fall outside the range of the present report.

A dosimetric chloroform inhaler is, after all, an instrument; its safe use must depend upon the user. Deaths may occur during its use which are due to many causes; the only one which the use of such an inhaler can obviate is that of giving an excessive dose. This report advances evidence that chloroform does not kill when inhaled in a vapour below a certain strength; it indicates that to avoid deaths, vapours below the danger limit, that is, not exceeding 2 per cent. during induction, should always be employed, and it further indicates that the most reliable way of accomplishing this end is to adopt an inhaler which can only supply vapours of chloroform within the safe zone. The machine must remain a machine and demands that the user shall possess knowledge and adequate skill. The safest method is that which leaves least to chance, and this it is believed is to be found in a dosimetric inhaler with a maximal delivery of a 2 per cent. vapour.

DUDLEY W. BUXTON,
July, 1910. *Honorary Secretary.*

APPENDIX TO REPORT.

MANAGEMENT OF THE VERNON HARCOURT INHALER IN DETAIL.

By Dr. DUDLEY BUXTON,

Honorary Secretary of the Committee.

The main points needing attention are: (1) Keeping the inhaler steady, so that the glass bottle is prevented from being shaken and the chloroform in it from splashing. Every splash means an increase in the area from which evaporation takes place, and this must cause a slightly higher percentage of chloroform vapour passing into the inhaler. The best means of preventing this in hospital work is to have a solid stand, to which the inhaler is clamped, with a branch carrying a plate, on which the bottle rests. The addition of a lower branch, carrying a night light, facilitates the regulation of the temperature of the chloroform.

In private practice a leather strap, or "lawyer's strap" and buckle, passed round the administrator's neck and supporting the inhaler, answers well, since a slight swing does not cause splashing. In this case the inhaler is connected with the facepiece by a length of tubing. The plane of the two valve chambers must be horizontal.

2. The valves must be all working freely. The expiration valve is best placed beneath the stem of the inhaler, where the flexible tube is attached. A stopcock may also be inserted at the same point for use if oxygen is to be employed with the chloroform. Mr. Harcourt has designed a special arrangement, whereby a constant oxygen supply from a bottle can be maintained without affecting the percentage marked on the indicator and without loss of oxygen during expiration. With this, also, the presence of the oxygen may be used to produce a *plenum*, when, owing to the nature of the operation, inhalation cannot be used, or in place of oxygen, bellows giving a continuous air pressure or timed to suit the breathing, can be employed.

It will be best to consider how to work this inhaler in the case of (1) children, (2) adults, (3) the aged, (4) unusual difficulties.

Special sizes of masks are supplied. As a rule three are sufficient—one very small, a medium, and larger size.

I.—IN CHILDREN.

It is sometimes difficult to obtain an accurate fit of the mask to the soft round face of infants, but the difficulty is more theoretical than real. The flanged mask is best, and even, not too forcible, pressure will usually prevent air leakage. If this fails a warm, moistened, soft towel placed below the chin and round the mask will secure a proper fit. The usual fault committed by inexperienced users of the mask is the use of excessive hand pressure. This causes pain and makes the child shrink from the mask. Most children are frightened whatever method is adopted, and it is a mistake to think their terror is increased by using a mask rather than a handkerchief. It is the pungency of the vapour they dislike, and breathing from an open mask such as a Schimmelbusch gives more vapour than the Harcourt. As a rule, a child will breathe quite steadily from the mask attached to this inhaler if the process is explained and encouragement is given to it. A few breaths of air followed by a 0.2 per cent. vapour reassures the child, and the percentage can rapidly be increased. If the child shrieks the mask and head must be gently but firmly kept in proper position, and the indicator turned to 0.5 per cent. Unless some abnormal symptom is present which indicates interference with breathing the mask should not be taken off the face at this stage. In a minute or so the deep inspirations associated with the screaming will ensure a rapid induction. As a rule, 1 per cent. suffices for babies, 1.5 per cent. for children up to 10 or 12. Children, however, vary within wide limits, and it is always desirable to lessen the time of the induction period for them, so that, if a

child aged between 5 and 15 does not go under within five minutes, it is best to raise the percentage to 2 for a few seconds until conjunctival reflex is abolished. At this point the percentage should at once be put back to 1.5 per cent., and as soon as the skin incisions are made, if no reflex muscular movements are evoked, the percentage should be made 1 per cent.

In long operations, when once the breathing has settled down to normal and complete anaesthesia is present, a 0.5 per cent. vapour will suffice. The lid reflex will be just present, light reaction brisk, and the pupil neither dilated nor contracted. The colour and skin temperature (felt by the hand) should be noticed; pallor and cooling are indications of excessive dosing with chloroform, and the percentage must be lessened or the mask removed altogether. If the case has been managed properly, and provided the operation is not one which as such causes great shock—that is, fall of blood pressure—the child's face should remain a coral pink throughout and at the end of inhalation. It must be remembered that children are very readily affected by posture; raising the head will at once deepen narcosis and cause fall of blood pressure. With weakly, feeble children, as soon as they have ceased to struggle, or, if no struggle has occurred, as soon as the breathing has settled down to the physiological normal, the head-rest should be lowered, the face turned to the side, and the head allowed to hang, so that it is just below the level of the thorax. Over-extension is as bad as over-flexion, and must be avoided. Every child has some particular posture in which he breathes most easily; the position chosen is usually determined by the length and fullness of the neck. Long thin necks are usually easily turned to the side, short thick necks are intolerant of lateral flexion unless the shoulder is also slightly turned by hunching up the pillow under it. As most children salivate easily even under chloroform, the lateral position is advisable, unless anatomical conditions render it impossible. It will be found that a child which breathes badly when the head is turned during the early stages of inhalation will respire easily and well when muscular relaxation is complete, that is, when the third degree of narcosis has been reached. The veins of the neck should never be allowed to become distended, and if they grow full the position of the head should be changed, the occiput tilted a little forwards, and the chin brought well in advance of the head.

A difficulty is at times experienced through the shallow breathing common among children. If they have not screamed and taken a few deep breaths, they become soothed by the chloroform vapour and doze off to sleep. In this state they present many of the recognized signs of anaesthesia. The eyeballs are turned up, and are either fixed or move so slowly that their oscillation is not detected. The lid reflex is practically abolished, and the pupils are about the size which exists in narcosis of the third degree. If the skin is cut at this stage, the child awakens with a howl and struggles. To prevent this mishap the breathing should be carefully studied throughout the induction period, and if it grows shallow and ineffectual early in the case while the colour remains good and the child is obviously well, the administrator should arouse the patient by moving the lower jaw forwards and backwards upon the maxilla, and rub the head and face with the hand. Thus disturbed, the child will resent being awakened, and will move, his breathing becoming more voluminous.

In other cases the shallow breathing is associated with pallor, and is the harbinger of vomiting. Provided it is known—and to be sure of a boy of 9 or 10 is not always easy—that no solid food has been taken for some hours before the inhalation, the best plan to adopt is to remove the mask, rub the lips briskly with a towel until they are red. The head should be lowered and the jaw pushed forward by the fingers placed behind the angles. If vomiting has taken place, the mask must be quickly wiped out, the face rubbed, and the inhalation resumed. It is always wise to detach the tube from the mask and shake it to see if any moisture has been coughed up into it. As vomiting is usually associated with some fall of blood pressure, heedful care must be taken in these emergencies to ensure that the circulation is properly restored. This is best done by posture, and it will be found that so soon as the head-rest is lowered, the colour will return and the pulse improve.

Too much reliance should not be placed upon ocular phenomena in children. The lid reflex often persists in one or both eyes even when the child is insensitive to pain. Indeed, having regard to what has been said about their tendency to sleep, the best test of anaesthesia in children is stimulation of a sensory area by pinching or what not. Reflex movements are very common in such operations as circumcision, incising the peritoneum in cases of appendicitis; and the mistake must not be made of pushing the anaesthetic, as, provided the third degree of narcosis has been reached, the only effect of deepening the sleep is to paralyse the nerve centres and subject the child to a risk of dangerous fall of blood pressure.

The respiration of children is easily interfered with and must be watched most closely. Pallor, blueness, failure of force of expiration may all indicate something prejudicing the proper filling and emptying of the lungs. Falling back of the tongue, pressure upon the chest, as when the child is turned on its side and the arm is hanging, an assistant's arm or excessive dosing with chloroform are all causes of this. Mucus, vomit, haemorrhage from the nose, engorgement of hypertrophied or inflamed tonsils, or a growth in the neck pressing on the trachea, may produce respiratory distress. The breathing under such circumstances will very often fail, though slowly and gradually, and unless looked for, the failure of respiration may escape observation. It cannot be too strongly insisted upon that weakening of respiration must never be passed by as of no importance. It always makes for danger, whether it is due to an overstrong chloroform vapour acting upon the respiratory centre, or to mechanical interference with the efficient to-and-fro breathing through the upper air passages. The nostrils of infants are commonly blocked by mucus, post-nasal adenoid growths or crusts, and if mouth breathing is prevented by faulty holding of the mask the child's breathing will be hampered or even prevented. If slimy mucus collects on the cheeks and the rubber of the mask it is quite easy for an unobservant person to allow the mask to slide completely, so that its lumen no longer coincides with the mouth and nose of the patient. From time to time it should be adjusted, and care be taken to see that the plane of the open end of the mask is exactly set at right angles to the plane of the child's face. Any undue pressure in one direction, such as may arise if the attention is allowed to flag, or if the hand has become tired through too much force having been expended in holding the mask in position, leads to the mask slipping out of position, and it then ceases to fit.

It is often suggested by persons who have had no experience of the use of the Vernon Harcourt inhaler, that the labour required to breathe through the inhaler is too much for delicate children, and itself produces an "asphyxial factor" fraught with ultimate danger. Experience, however, proves this is not so. The method in question is an ideal one for children, and should be pursued in all cases. When the operation is to take place upon the buccal cavity or naso-pharynx, induction of anaesthesia—that is, the time of maximum danger—should be carried through by means of this inhaler, and anaesthesia maintained by a mouth tube, through which chloroform vapour is blown by a hand-bellows fitted to the inhaler. When this is in use, the strength of the vapour will be less than the percentages marked if the blast of air raises the valve higher than usual.

II.—In Adults.

The head should be turned to the side opposite to that on which the operation is to be performed; in the case of a median operation the side elected should be the one usually adopted by the patient in sleep. When the lithotomy position will be adopted, the head should face the side on which the neck strap passes behind the shoulder.

The mask selected should fit without causing discomfort and should reach from the root of the nose, but must not rest upon the forehead, to the curve of the chin. When the buccal fat pads are wasted the air cushion should press upon the cheeks upon each side of the nose. When the nose is of the Roman type with a high bridge, too much pressure must not be made at the apex or discomfort will be felt and the nose be sore after a long operation. It

is easy to avoid this by placing a fold or two of soft lint or cambric handkerchief over the bridge of the nose. This can be made to protect the eyes also. When the rubber pad is filled with water (instead of air) the inconvenience due to pressure is much diminished. Leakage of air from a badly-fitting mask or through irregular pressure takes place most commonly at the root of the nose or opposite the cheeks. When the mask is held on the upper side the tendency is to lift the mask off the face on the side on which it lies. If held on the lower side the converse obtains. If a dental prop is not inserted before the administration—and this is not as a rule necessary—the lower jaw should be advanced when the mask is applied and care taken that the lower lip is neither then nor later allowed to be sucked in between the teeth, or it may be bruised or bitten.

Experience has shown that the inhalation can be commenced with a 0.2 per cent., and after a few breaths increased to 0.5 per cent., then within half a minute 1 per cent. can be used. If the patient breathes this freely after a minute 1.5 per cent., and after another 2 per cent., should be given. It is essential that the patient should be encouraged to breathe freely; if he does not do so it arises from timidity, too strong a vapour, or because the mask is not fitting, and he is enabled by soft inspirations to draw in air round the inflated pad without aspirating through the inhaler.

The appropriate treatment is obvious, and must not be neglected. In semi-unconsciousness the breathing often becomes very shallow, the patient doses, and his lung ventilation can be promoted by pushing the jaw forwards two or three times, or by turning the head and so rousing him. If in the first two minutes the breathing becomes rapid, deep, and irregular, the percentage should be kept at 1 per cent. until the normal rhythm is regained. Struggling, holding of the breath need not cause alarm. The patient cannot get more than a 2 per cent. vapour, and this during the induction period is safe, and so the mask can be kept on.

This statement is true only when the administrator is certain that no intercurrent cause exists which is interfering with respiration. Such causes may be mucus, regurgitation from the stomach, faulty posture, falling back of the tongue, dropping of the chin, insuck of the lips against the teeth, glottic spasm, foreign bodies, such as detached nasal polypi, blood clots from epistaxis, portions of fungating growths, and even lumbrici worms. To this list we must add the rare but occasional supervention of muscular spasm affecting the buccinators, masseters, and palate muscles, leading to rigid closure of the jaws and fixation of the larynx behind the retracted tongue. Again, central causes affecting the medullary centres may exist and produce respiratory arrest.

Induction takes on an average six or eight minutes; children grow anaesthetic more quickly, while weak breathers, powerful and vigorous adults, subjects of the alcohol or drug habits, require more time. The usual reason why patients take a long time is that the mask is not fitting accurately.

When the lid reflex is lost and the muscles are relaxed, the breathing having settled down into its normal rhythm, the vapour strength of chloroform can be lessened according to the necessities of the patient and the requirements of the operation. As the depth of narcosis is dependent entirely upon the level of partial saturation of the blood and tissues with chloroform, the quality and quantity of these will determine the length of time during which the 2 per cent. will be required. Some persons after fifteen minutes will not need more than 1 per cent., others must inhale 2 per cent. for thirty minutes or more. If cyanosis, weakening of the breathing or muscular rigidity appears, the percentage must be lowered. If very sensitive structures such as the anal, rectal, or genito-urinary organs, or the peritoneum, are being manipulated, 2 per cent. will probably be required. As soon as the operation is well forward, and no reflexes occur which may interfere with operation, the percentage must be gradually lowered. At the end of an operation, when the peritoneum or skin is being stitched, it is frequently necessary to return to a 2 per cent. for a few breaths.

Although the Committee adopted the 2 per cent. as a maximum, being convinced that higher percentages are always dangerous and frequently cause fatal accidents, they recognize that in the practice of some surgeons and for some operations a high-strength vapour may be called for, and this is provided by the increase tube, which permits of the use of a 2.5 per cent. vapour. They suggest, however, that such strength should be used only most exceptionally, and even then only with the clear appreciation that such a vapour may cause serious dangers either during inhalation or by producing serious after-effects.

The incidents of the induction period call for little further notice—struggling is uncommon, nausea and vomiting in exceptional cases may come on and are due to some gastro-intestinal cause or to nervousness.

During the maintenance of anaesthesia for a prolonged operation the Vernon Harcourt inhaler is of especial value. The conditions of shock leading to fall of blood pressure, and so involving diminished activities of the respiratory and circulatory centres and rendering them more liable to profound narcosis by even a 2 per cent. vapour or less, require definite changes in the dosage of the chloroform given. This is readily effected by lessening the percentage. When temporary shock is relieved, as when the peritoneal or cerebral tissues are relieved from dragging, or haemorrhage is controlled, the patient may require a slightly stronger vapour, and this again is instantly obtained by putting the indicator to 1 per cent. or 1.5 per cent., as the case may be. Even when no serious shock is produced a uniform inhalation of 2 per cent. or of a lower percentage will after an hour cause shock by lowering the blood pressure and overdrugging the centres. This can be at once remedied, or, still better, can be obviated altogether, by gradually decreasing the amount of chloroform presented to the patient. When complete mastery of the method has been obtained an extremely small amount of the anaesthetic will be used for the most prolonged cases, and even after three or four hours the patient will retain a good blood pressure, evidenced by the bright colour of the face, lips, and ears and the rapid resumption of consciousness.

In *obstetric practice* the Vernon Harcourt inhaler can be suspended at the head of the bed and the patient can hold the facepiece. When full anaesthesia is required, the attendant completes the induction by holding the mask in position. In no class of cases is the advantage of being able to vary at pleasure the strength of the vapour given more conspicuous.

The *after-effects* due to chloroform are directly proportionate to the amount of the anaesthetic inhaled. They are due to its elimination, which takes place from the lungs, causing chilling; through the liver and kidneys, causing catarrh. When excessive quantities have to pass through the organs, as must be the case when massive doses have to be eliminated, these after-effects are severe.

The *recovery* of patients chloroformed by dosimetric methods presents a marked contrast to that seen when the older methods are adopted. There is little headache, nausea, or vomiting, and the mind becomes clear within a short time of the discontinuance of the inhalation. Since pursuing this method those of the Committee who have had practical knowledge upon this point are greatly impressed by the more favourable results obtained, and the patients themselves expressed the benefit of dosimetric methods.

III.—In Old Persons.

Perhaps these patients demonstrate most thoroughly the advantage of using a low percentage vapour. Their tissues are less easily able to combat heavy doses of chloroform, and struggling offers more danger to their arteries and heart than is the case with younger persons. They are more liable to catarrh and to nephritis. Since, then, a low percentage vapour lessens the danger of such complications, *pro tanto* are old persons benefited by it.

The practical difficulties of using the inhaler centre round the fitting of the mask. When the jaws are edentulous and absorbed, the cheeks are atonic and baggy, some special care has to be taken to insure the air way being kept well open, and yet the mask so held that no leakage occurs round the pad. This can always be done. If the case is extreme, a covered mouth prop between the gums in front and a wet towel round the mask, while the lower

jaw is pushed forward and the chin *not* pressed up, will secure an accurate coadaptation between the face and the mask.

IV.—The Employment of the Vernon Harcourt Inhaler in Special Cases.

(*a*) Operations of the mouth, nose, and throat.
(*b*) Operations on the brain and spinal cord.
(*c*) Abdominal sections.
(*d*) Abdominal sections in the Trendelenburg position.
(*e*) Operations on the pleurae and lungs.
(*f*) In cases of severe shock and collapse.

(*a*) The only special feature in such cases is the possibility of there being some pathological condition interfering with normal respiration—for example, fixation of the tongue, or the liability of its stump falling back if extirpation had been performed at an antecedent operation. Stenosis of the larynx, blocking of the nostrils, or semiclosure of the faucial arch by inflamed hypertrophied tonsils are all conditions which render it necessary to keep the mouth open during the induction. This can be done by a dental gag or mouth tube of large bore secured by tape and fixed between the front teeth, or gums. The tongue should be secured by a stitch passed through it as soon as semi-unconsciousness has developed. This procedure is far less painful and leaves less soreness than keeping the tongue forward by tongue clips or forceps, and the ligature can be secured under the mask. It is always worth while to use this inhaler for the induction, since in this period the chief danger of chloroformization exists, even if the exigencies of the operation require the employment of a Junker's bottle, bellows, and mouth tube during the actual operation. It is, however, possible in some cases, by connecting the supply tube of the Harcourt inhaler with a nasal or laryngeal tube, to pursue the after-anaesthetization by its means. When the mouth is widely open and there is much blood effused it is not easy to establish sufficient continuous breathing through such a tube. Or the means described on p. 69 may be used.

Operations for the removal of goitres require a minimal quantity of chloroform and a low percentage vapour. There is usually a profuse salivation and great liability to reflex inhibition of respiration and circulation. In many of such cases an "asphyxial factor" exists, and those who have no experience of the Vernon Harcourt inhaler would be inclined to think this offered an impediment to any method which required a patient to obtain his air supply through a dead space—the mask and tube—and an inhaler. As a matter of fact the inhaler is of singular value in these very cases and removes most of the anxieties which they occasioned when the older methods were in vogue. Some members of the Committee have enjoyed a large experience of such operations, including many where the graver dangers of exophthalmic goitre were present, and their experience has shown that no increased respiratory difficulty occurs, while the inhaler enables the administrator to control the percentage in a way which renders it possible to obtain the exact degree of analgesia or anaesthesia requisite for the various stages of the operation. The reflex inhibition of the heart or of respiration is under these circumstances no longer a peril which is likely to provoke serious consequences.

(*b*) In the case of operations upon the brain and spinal cord, it is essential as soon as complete anaesthesia is established to give a very low percentage of chloroform vapour or to withhold the anaesthetic altogether at times. Even great experience of such operations cannot divest the anaesthetic of danger unless the administrator can ensure an accurate and exact control of the percentage value of the vapour inhaled. With the Vernon Harcourt inhaler this is secured, and complete but light anaesthesia may be relied upon during the actual manipulation of the nervous structures and a slightly increased depth of narcosis when the flaps are being sutured. In all these cases, and especially when the patients are children, the maximum percentage must be low, probably 1 per cent. or 1.5 per cent. at first and 0.5 per cent. or less after induction.

(*c*) and (*d*). The main difficulties are those due to imperfect relaxation of the abdominal parietes. Two causes of this are active. Over painful areas muscles assume a spasmodic contraction—no doubt primarily a protective reflex—and this takes a considerable time before it is overcome, although steady traction made after the incision is completed will usually control it. The other cause is asphyxial, and commonly results from the administrator of the anaesthetic, anxious to obtain rapid relaxation, being tempted to press the chloroform and give too concentrated a vapour. The recti abdominis muscles are to all intents and purposes respiratory muscles, and do not lose their tonus until the respiratory centre is overdosed with chloroform and is failing; while in slight degrees of asphyxia when cyanosis is present these muscles are provoked to vigorous contractions, and rigidity results. The head-down position is very commonly productive of some venous engorgement of the head, and is provocative of muscular rigidity. Indeed, in some cases it is necessary to employ large quantities of oxygen with the chloroform to overcome the condition.

To obtain quiet, regular breathing, which is the essential requirement of relaxation, it is usually advisable to devote more than the common length of time to the induction, and to avoid pressing the anaesthetic, that is, withholding the 2 per cent. until just before complete anaesthesia, judged by loss of the conjunctival reflex, is obtained. At this stage 2 per cent. will in time produce muscular relaxation, provided all cyanosis is prevented and the breathing is encouraged by pushing forward the lower jaw with each inspiration. Slow, weak breathing, so usual in cases of painful abdominal affections, the result of efforts persevered in for days or weeks to prevent pressure by contraction of the abdominal parietes over a painful area, will frequently persist even into the period of induction, and when this occurs the patient will go under very slowly unless the suggestions made above are adopted. When time is a matter of urgency a slightly higher percentage may be employed as soon as the ocular reflexes show that the third degree of narcosis has been reached and the pupils are contracting while the eyeballs are fixed. This percentage should be discontinued as soon as the skin incision is made, as this will act as a stimulus to respiration and the patient will readily inhale full breaths of the vapour.

During the operation different depths of narcosis are required. Extrusion of the stomach and duodenum in gastro-enterotomy, pulling up the stomach into the wound in gastrostomy, extrusion of the liver over the costal border in gall bladder operations, presentation of the kidney into the flank in renal operations, manipulation of the caecum or large gut in appendicotomy, or inguinal colotomy, and introduction of the hand into the bladder for enucleation of the prostate, all require full narcosis of the third degree, and a 2 per cent. vapour will be usually required, and may be continued.

During the further stages of these proceedings the percentage may be lowered, but at the close of the operation, when the peritoneum has to be sewn up—and this applies also to hysterectomies and pelvic operations performed through the abdominal route—it is necessary to increase the percentage to the maximum 2 per cent. until the muscles are secured.

(*e*) In thoracic surgery, especially where a bronchiectasis, an empyema, or a pulmonary abscess opens into a bronchus, profound narcosis would lead to grave respiratory embarrassment, and death through retention of secretions in the lungs. Also the sudden liberation of a quantity of fluid from the pleural cavity may suddenly affect the position of the heart and produce serious interference with its action, and this, in the case of a heart which has been subjected to a high tension of chloroform in its blood supply, often proves fatal. These dangers are overcome by the employment of a regulating inhaler, which, as soon as true anaesthesia is obtained, should be made to deliver as low a percentage vapour as is consistent with abolition of pain. Probably 0.5 per cent. will suffice.

(*f*) In conditions of grave collapse the effect of even low percentages of chloroform causes further fall of blood pressure, so that it is best to commence the inhalation with 0.2 per cent. and increase the percentage slowly until 1 per cent. is reached. It is seldom necessary or safe to exceed this limit. The patient's condition commonly improves as he goes under, and this is especially the case if there has been much actual pain. Small quantities of chloroform cause anaesthesia in these cases, and very low percentages—for example, 0.5 per cent. or less—are competent to maintain anaesthesia during operation.

Meetings of Branches & Divisions.

[*The proceedings of the Divisions and Branches of the Association relating to Scientific and Clinical Medicine, when reported by the Honorary Secretaries, are published in the body of the* JOURNAL.]

BIRMINGHAM BRANCH:
COVENTRY DIVISION.

THE annual general meeting was held at the Masonic Hall on June 21st.

Election of Officers.—The following were elected officers for 1910–11: *Chairman*, Dr. E. H. Snell; *Vice-Chairman*, Dr. John Horton; *Honorary Secretary and Treasurer*, Dr. Vaughan Pendred; *Representatives on Branch Council*, Drs. Orton and Pendred; *Executive Committee*, Drs. Rice, Phillips, Brown, Lowman, Soden, Kendrick; *Representative at Representative Meeting*, Dr. Milner Moore was unanimously re-elected.

Report of Executive Committee.—The annual report of the Executive Committee for the year and the balance sheet was presented to the meeting.

Formation of New Company.—The decision of the Central Council to form the Association into a new company with increased powers was approved.

BORDER COUNTIES BRANCH:
ENGLISH DIVISION.

THE third annual meeting of this Division was held at Carlisle on Friday, June 24th, at 3.15 p.m. Dr. FARQUHARSON (Carlisle) was in the chair.

Election of Officers.—The members elected to office for the ensuing year were: *Chairman*, J. W. Crerar, M.B. (Maryport); *Vice-Chairman*, D. Edington, M.D. (Penrith); *Honorary Secretary*, James R. S. Anderson, M.B. (Carlisle); *Representative for Representative Meeting*, Dr. C. W. Graham (Carlisle); *Representatives on Branch Council*, Drs. Bowser, Penny, and Graham; *Ethical Committee*, Drs. Macdonald and Barnes; *Executive Committee*, Henry Barnes, M.D., J. E. Bowser, M.B., J. R. Burnett, M.D., D. S. Doughty, M.D., F. H. Morison, M.D., G. B. Muriel, M.B.

EAST ANGLIAN BRANCH.

THE annual meeting of the Branch was held at the Town Hall, Thetford, on Thursday, June 16th.

Council Meeting.

The Council meeting was held at 11.45 o'clock, and there were present: Dr. W. H. Slimon, Dr. Pembroke Minns, Dr. Nicholson, Mr. Ballance, Dr. Gutch, Dr. Caie, Dr. Thomas, Dr. Thompson, Dr. Potts, and Dr. Barton.

Confirmation of Minutes.—The minutes of the last meeting were read and confirmed.

New Members.—The following gentlemen were elected members of the British Medical Association: Dr. J. W. Cook (Clacton-on-Sea), Dr. McCail (Colchester), Dr. Smyth (Colchester), Dr. Charles Allen (Southend).

Annual Report.—The annual report was read by the SECRETARY, and on the proposition of Dr. CAIE, seconded by Dr. GUTCH, it was adopted.

Autumn Meeting.—It was proposed by Dr. THOMAS, and seconded by Dr. CAIE, that the autumn meeting should be held at Hunstanton, and the resolution was agreed to.

General Meeting.

The general meeting commenced at 12.15 o'clock, Dr. SLIMON (President of the Branch) being in the chair.

The Death of King Edward.—The CHAIRMAN, in a few remarks, proposed that a letter of condolence, in the following terms, be sent to His Majesty King George V, and to Her Majesty Queen Alexandra:

To the King's Most Excellent Majesty. May it please your Majesty—We the members of the East Anglian Branch of the British Medical Association do beg to approach your Majesty for the purpose of conveying an expression of our heartfelt sorrow at the bereavement which has befallen your Majesty, the members of the Royal Family, and the whole empire, at the death of our beloved King.

To Her Majesty Queen Alexandra. May it please your Majesty—We the members of the East Anglian Branch of the British Medical Association desire to offer to your Majesty an expression of our profound grief at the irreparable loss which has befallen your Majesty by the death of our beloved Sovereign, King Edward VII. We hope your Majesty may be long spared to your devoted people.

This proposition was agreed to in silence, all standing.

Confirmation of Minutes.—The SECRETARY then read the minutes of the last general meeting, which were signed.

Annual Report.—The annual report, which was read by the SECRETARY, was to the following effect: The Council have pleasure to report that the Branch is in a prosperous condition. Twenty-one new members have been elected during the year. There are 442 members in the Branch, exclusive of associate members. The annual meeting was held at Clacton-on-Sea, under the presidency of Dr. W. H. Slimon. The meeting was largely attended, and was most successful. Luncheon was kindly given by the President, and was attended by about sixty members and friends. Dr. Slimon addressed the members on Severe gastric disturbances caused by trivial pathological conditions of uterus and adnexae. At the conclusion of the address a hearty vote of thanks was accorded to Dr. Slimon, on the proposition of Major Freeman, seconded by Dr. Curl. Dr. H. Macnaughton-Jones read a paper on Uterine haemorrhage, and illustrated the paper by most interesting specimens. The Council desires to express its warm thanks to Dr. and Mrs. Slimon for their unbounded hospitality to every one present on that occasion. The autumn meeting was held at the Royal Assembly Rooms, Great Yarmouth, in October. Interesting papers were read by Dr. Muir Evans (Lowestoft), Dr. Leonard Lay (Great Yarmouth), and Dr. Milner Burgess (Frinton-on-Sea); and Dr. A. F. Cleveland (Norwich) showed some interesting specimens. A special meeting of the Council was held at Ipswich in March for the consideration of the reports of the Divisions. The work of the Divisions has been most satisfactory. The spring meeting was held at Southend-on-Sea in April. The President (Dr. Slimon) read a paper on Menorrhagia, and Dr. Robert Hutchinson, of the London Hospital, read a paper on the Therapeutic value of diet; Dr. George Pernet read a paper on the Intramuscular treatment of syphilis. The Council desires to place on record its sincere thanks to the Southend Division for their kind hospitality on that occasion. It was resolved that the annual meeting in 1911 should be held at Norwich, and that Dr. Burton-Fanning should be invited to become President. Dr. Burton-Fanning has replied in a kind letter accepting the honour.

Election of Officers.—It was announced that the following had been elected officers for 1910–11: *President*, Dr. Pembroke Minns (Thetford); *President-elect*, Dr. Burton-Fanning (Norwich); *Vice-Presidents*, Dr. R. W. Brogden (Ipswich), Dr. D. G. Thomson (Norwich), and Dr. W. H. Slimon (Clacton-on-Sea); *Secretary for Essex*, Dr. B. H. Nicholson (Colchester); *Secretary for Norfolk*, Dr. H. A. Ballance (Norwich); *Secretary for Suffolk*, Dr. H. A. Gutch (Ipswich); *General Secretary and Treasurer*, Dr. B. H. Nicholson (Colchester).

Financial Statement.—The financial statement showed a balance in hand on December 31st, 1909, of £81 2s. 3d.

Adoption of Reports.—The CHAIRMAN formally moved the adoption of the reports, Dr. GUTCH seconded, and the resolution was carried unanimously.

Paper.—The CHAIRMAN, having got through the formal business of the meeting, then called upon Dr. PEMBROKE MINNS, President-elect, to read a paper on Notes on two cases of errors in diagnosis. At the conclusion of the paper, which was discussed by the CHAIRMAN (Dr. Slimon) and Mr. BALLANCE, a hearty vote of thanks was accorded to Dr. Pembroke Minns, by the members present.

Luncheon.—Luncheon was partaken of at one o'clock in the Town Hall by the kind invitation of the

President-elect, Dr. Pembroke Minns, at which about forty gentlemen were present.

Installation of New President.—The general meeting was resumed in the Town Hall at two o'clock, and Dr. Slimon introduced Dr. Pembroke Minns as President of the Branch for 1910 11. Dr. Minns replied and thanked the members of the Branch for the honour they had conferred upon him.

Vote of Thanks to Retiring President.—Dr. Sinclair Holden then proposed a vote of thanks to Dr. Slimon. The following resolution was adopted:

> That a hearty vote of thanks be accorded to Dr. W. H. Slimon for the very excellent and assiduous manner in which he has carried out his duties as President of the Branch, and that he hereby be elected a Vice-President for the next three years.

This resolution was seconded by Dr. Thomson and carried by acclamation. Dr. Slimon replied and thanked the Branch for the kindness he had received during his year of office.

Papers.—Mr. Joseph Griffiths, F.R.C.S. (Cambridge), read a paper on Fractures of the ankle and their treatment. The paper was illustrated by many interesting specimens, and was discussed by Dr. Slimon and Mr. Ballance, and Mr. Griffiths replied. Dr. H. H. Brown, of Ipswich, read a paper on Appendicitis, and some points in connexion with operations. The paper was discussed by Mr. Ballance and Mr. Griffiths, and Dr. Brown replied. Dr. Bernard Batt (Bury St. Edmunds) read a paper on Sudden death during or immediately following labour. The paper was discussed by Dr. Slimon, Dr. Hinnell, Dr. Potts, Dr. Caie, and Dr. Howie, and Dr. Batt replied.

Garden Party.—At four o'clock a garden party was held at The Limes by the kind invitation of Miss Minns, Mrs. Harris, and Mrs. Allen Minns.

Exhibit.—Surgical instruments were shown by Messrs. Down Brothers.

Members Present.—The following gentlemen were present: Drs. Slimon, Pembroke Minns, Curl, Barton, Whartham, Archer, Steele, Hinnell, Shinnie, Howie, Owers, Masson, Batt, Caie, Thomson, Allen Minns, J. Thomson, Adams, Coutts, Howard, Potts, Beverley, Muriel, Kevern, Thomas, Bassano, Alexander, Harris, Cowan, Pickworth, Gutch, Cross, Ballance, Thomson, H. H. Brown, Nicholson, and Griffiths.

EDINBURGH BRANCH:
North-West Edinburgh Division.

The annual meeting of the Division was held on Monday, June 20th, at 5, St. Andrew Square, Edinburgh. Dr. Ritchie presided.

Confirmation of Minutes.—The Secretary read the minutes of the last meeting, which were approved.

Annual Report.—The annual report was read and approved.

Election of Office-bearers.—The office-bearers for 1910–11 were elected as follows: *Chairman*, Dr. Jas. Ritchie; *Vice-Chairman*, Dr. James; *Secretary and Treasurer*, Dr. F. D. Simpson; *Executive Committee*, Drs. Gibson, Haig Ferguson, Lackie, W. T. Ritchie, Peddie, and Graham; *Representatives on Branch Council*, Drs. Ballantyne and Simpson; *Representative of Division at Annual Meeting*, Dr. Sinclair.

Matters Referred to Divisions.—The meeting then considered the various matters referred to Divisions, and instructions were given to the Representative regarding them.

GLASGOW AND WEST OF SCOTLAND BRANCH.

The annual general meeting of the Branch was held in the Grosvenor Restaurant on Friday, May 27th, at 8.30 p.m. Professor Stockman presided.

Confirmation of Minutes.—The minutes of the previous meetings—(*a*) annual meeting, (*b*) special meeting—were read and approved.

Apologies for Non-attendance.—Letters of apology from Drs. Yellowlees, W. L. Reid, John McVail, Professor Bryce and others were read.

Secretary's Report.

The Honorary Secretary's report was to the following effect:

On December 31st, 1908, the membership of the Branch was 687; on December 31st, 1909, the membership was 672, a decrease of 15 members; 36 new members have been added; 51 members have been lost to the Branch—9 by death, 9 by resignation, 26 through change of address, and the remainder due to unpaid arrears. There have been three meetings of the Branch and twelve Branch Council meetings. The following matters have engaged the attention of the Council and the Branch:

Glasgow School Board Part-time Medical Appointments.—Two special meetings of the Branch and practitioners resident in Glasgow and district were held in the Faculty Hall, 242, St. Vincent Street, Glasgow, to consider the question of payment offered by the Glasgow School Board to medical practitioners. As the remuneration offered did not seem adequate for the work to be performed, and, further, as it did not meet the minimum adopted by the Association at its annual meeting in Belfast, a subcommittee was appointed to confer with the Glasgow School Board on this question. This conference took place, and a report was submitted to a special meeting convened in a similar manner to the first. The School Board of Glasgow did not accede to the wishes of the Association, and as a result their appointments were placed on the Warning Notice of the Journal. It is a matter of great regret that several members of the Association did not fall in line with the policy of the Association, and that, further, they accepted part-time appointments under the Glasgow School Board. Four members who accepted these appointments resigned their membership; four members who also had accepted appointments were dealt with by the Central Council.

Question of Payment for Attendance on Street Accidents.—A subcommittee comprising Professor R. Jardine, Dr. William Bryce, and the Secretary, interviewed the Glasgow Town Council (Lighting and Watching Committee) on this matter. The satisfactory result of this conference has already been communicated to the Branch by special circular.

Govan Medical Association v. the Govan Cottage Nurses' Training Home.—As the result of prolonged discussion and correspondence, the Govan Cottage Nurses' Training Home Executive agreed to forego the charge which was being made by them for the attendance on midwifery cases by their nurses. It is hoped that an amicable settlement will be arrived at, and Dr. Campbell Munro, ex-President of the Association, is conferring with both parties to effect such a result.

Dr. Ponder and Dundonald and Symington Nursing Association.—Considerable difficulty and prolonged correspondence was occasioned by the differences of Dr. Ponder and the Nursing Association. The Council investigated matters on Dr. Ponder's behalf. Dr. Ponder's untimely death ended the matter.

Medical Inspection of School Children.—The medical inspection of school children and treatment of those found on examination to be defective is under consideration of the subcommittee appointed by the Branch and practitioners resident in Glasgow and district at the special meeting called for that purpose.

Abuse of Medical Charities in Glasgow.—The subcommittee—consisting of Professor Stockman, Dr. A. Campbell Munro, Mr. James Grant Andrew, and the Secretary—has had several meetings to consider the question of the abuse of medical charities. It has likewise had a conference with the medical superintendents of the Royal, Western, and Victoria Infirmaries, and also with the managers of these same infirmaries. A further conference with the managers of these institutions is to be held.

Treasurer's Report.—The following is an abstract of income and expenditure for the year ending December 31st, 1909:

INCOME.

	£	s.	d.
Balance in hand, December 31st, 1908	312	3	2
Capitation grant for year 1909	67	2	0
Returned by Divisions	20	5	1
Bank interest—Royal Bank of Scotland .. £0 15 0			
Bank of Scotland 3 7 9			
	4	2	9
	£403	13	0

EXPENDITURE.

	£	s.	d.
Grants to Divisions:			
1. Ayrshire	4	19	0
2. Dumbartonshire	3	10	6
3. Lanarkshire	5	14	0
4. Renfrewshire	5	18	6
5. Glasgow Central	9	7	6
6. Glasgow Eastern	5	14	0
7. Glasgow North-Western	8	15	6
8. Glasgow Southern	6	12	0
Additional to Glasgow Southern	1	12	7
Hire of rooms	11	16	6
Secretarial expenses:			
Printing and posting circulars, etc.	30	12	5
Stationary and postages	3	14	11
Clerical aid	8	11	6
Bank charges	0	2	10
Items not included in above:			
Expenses incurred by Branch Ethical Committee	2	8	2
Advertising and incidental expenses of social meeting	4	16	0
Balance at December 31st, 1909	289	7	1
	403	13	0

March 10th, 1910.—Examined, compared with the vouchers, and found correct, balance at the bank being £289 7s. 1d.

(Signed) W. SEMPLE YOUNG, W. F. BROWN } *Auditors.*

Election of Office-bearers.—The following office-bearers were duly elected: *President*, Dr. J. N. Marshall; *President-elect*, Dr. W. L. Muir; *Vice-Presidents*, Professor Ralph Stockman and Dr. A. Campbell Munro; *Secretary*, Dr. W. D. Macfarlane, jun.; *Treasurer*, Dr. J. P. Duncan.

Dr. W. L. MUIR stated that members who were in arrears with annual subscriptions often had the JOURNAL sent to them for long periods without payment. This should be rectified. Questions were raised by Drs. S. SLOAN, MURDOCH CAMERON, and J. HAMILTON regarding the School Board part-time appointments. Dr. W. D. MACFARLANE explained to the meeting the position of the Branch, and the finding of the Central Committee. His statement was unofficial, as he had received no intimation of what had happened at the committee meeting in London. Dr. FREELAND FERGUS moved the adoption of the Secretary's report. Dr. HAMILTON seconded, and it was unanimously agreed to. Dr. SYME moved, and Dr. G. BURNSIDE BUCHANAN seconded, the adoption of the Treasurer's report, and it was unanimously agreed to. A discussion took place on the question of the annual grant. Dr. W. L. MUIR said that the Branch should receive a payment of 4s. per head. He would raise this question at the Annual Representative Meeting.

President's Address.—Professor STOCKMAN cordially welcomed Dr. J. N. Marshall as President, and was certain he would maintain the high traditions of the chair. Dr. MARSHALL, having thanked the Branch for the honour, delivered the following address:

I have to congratulate the Branch on the work which has been accomplished during the past year. Several difficult problems have been discussed, and in some, at any rate, a way towards a solution has been found. At the present time the profession, and especially that part of it which is made up of general practitioners, is faced with a state of affairs which threatens to alter materially our mode of earning a living. There seems to be on the part of the public an increased demand for what might be called institutional treatment—for treatment in a nursing home or a hospital—and on the other hand, on the part of our governing bodies there is an increased tendency to become responsible for the care of sick people. In either event the work of the general practitioner is encroached upon. If it were possible, and if it were for the good of the public, to eliminate altogether the general practitioner, then there would be nothing more to say. But it is not possible to do without the general practitioner. There must always remain work, and important work too, which he alone can do, and upon the doing of that work will depend in large measure the health and comfort of the community. But if he is to remain, then it is the duty and interest of the public, as it is also the duty and interest of the British Medical Association, to see that his position is one that will enable him to earn a decent living, and to see also that in his work he will have facilities for using the best methods of medical science. The Association can do much for medical men if the men will only help themselves by working loyally together. Its function lies in influencing and advising rather than in coercing, for its powers of coercion are limited. But if it is to influence the public as well as the whole body of the medical profession it must be prepared to show that what it advises is for the interest of the whole community. The Association has been called by some a trades union, the term being used as one of opprobrium, but for my own part I see no opprobrium in its use. It is our duty to use all means to conserve our own best interests, for we know that those are also the best interests of the public. The Royal Commission on the Poor Law has forcibly pointed out that it is as bad for a public body as for an individual to get something for nothing, and it is clearly our duty to circumvent public bodies when they endeavour to exercise the gentle art of getting something for nothing. There is one aspect of affairs which has for long seemed to me to want improving, and that is the relation of general practitioners to hospitals. The question of hospital abuse is, and has been, long before the profession, but the simple policy of restricting patients from going to free hospitals will not, I think, do very much for us. Many patients have got it into their heads that the best medical treatment is to be obtained at institutions where there is a full equipment of instruments and apparatus, a service of nurses, and an attendance of hospital surgeons and physicians, and it cannot be denied that those patients are sometimes right. It would, moreover, be useless to try and convince the public that the man who needed those things should not have them unless he was either poverty-stricken or in affluent circumstances. The great majority of our population are neither. The method by which the attendance of doctors at hospitals has been secured in the past has been mainly by the granting of a sort of monopoly. The doctor gives his services to the hospital for a very small remuneration, the main consideration being that he has the opportunity of acquiring skill and practice, which those outside the hospital do not have. This system has worked fairly well in the past, and must necessarily, I suppose, be the one used at the large teaching hospitals. In view of the great changes which have taken place and which are now taking place in medical practice, it seems that some modification of the system is required. The hospital physicians and surgeons are having work thrust upon them which they hardly bargained for: First, people who are not poor, but who are not able to pay large fees; and, secondly, poor people who are sent by public bodies. The hospitals are being enlarged and hospital staffs increased, but still there seems no meeting of the demand. On the other hand, the general practitioner is being deprived of his legitimate work. This not only diminishes his income, but hurts him in an even more important manner by depriving him of work which is educative in a high degree. If his important cases go away from his care to nursing homes or hospitals, can it be wondered at that his practice becomes uninteresting and his work second-rate? Is there any remedy for this state of affairs? I believe a good remedy is to be found in the extension of the cottage hospital plan, which means, in other words, the providing of hospitals to be used by general practitioners. But it would be no remedy, but only an extension of the evil, if the monopoly plan were carried out in the appointment of the staff to these hospitals. The practice of the hospital must be open to all the

medical men living in the district, the medical men sending in their own patients and attending them themselves with or without the assistance of a colleague or consultant. The other point in which these hospitals should differ from the large teaching hospitals is that each patient should pay what he can afford, both to the hospital and to the medical man attending him. There would necessarily be some patients who could not afford to pay anything, and if these were not provided for by public bodies, it would be for the doctors in the district to decide whether each should do his own gratuitous work, or whether they should appoint in rotation one of their own number to do it. Besides the working classes, these institutions might well accommodate in private rooms those who were better off, and thus provide an economic nursing home. In many country districts such hospitals are in existence and are working well. The establishment of them in town would seem to present more difficulty, but I do not believe that the difficulties are insuperable, and the advantages are certainly very great. An institution like this would help to solve many difficult questions. Hospital abuse would be lessened, for the workman could have hospital treatment from his own doctor near his own door, and those patients who still went to free dispensaries, and who were unsuitable, might be more easily restricted when there was an institution like this to which they might be referred. The cottage hospital would provide an excellent school clinic where the general practitioner, whether paid privately or by the School Board, might carry out treatment satisfactorily. The provident dispensary outlined by the Majority Report of the Poor Law Commission, if it ever comes into existence, would find in the cottage hospital excellent machinery for its working. The cottage hospital would not, of course, supersede the large general hospital. It would be complementary to it, and would relieve it of many minor cases and at the same time feed it with important ones. As an example of such a cottage hospital, it might be worth while to refer for a moment to one which we have had in Bute for about fifteen years. It was built at a cost of £3,000, and accommodates 10 ward and 3 private patients. The number of patients admitted in one year is 120, with about the same number of outdoor patients, and the cost of upkeep amounts to about £700. The income is made up in nearly equal proportion by subscriptions from the public, interest on endowment, and payments by patients. Ward patients pay, when they are able, 7s. per week, and private patients 30s. per week. About one-third of the patients are admitted free. Private patients and many of the ward patients pay such fees as they can afford to the doctors attending them. This hospital serves a population of about 12,000, with some five or six doctors, who all send in patients and attend them, not in rotation, but simultaneously, the patients being passed in by a committee on a line from the doctor. The management consists of a representative committee, and includes all the medical men. The hospital is recognized as an institution which may be used, and is used, by the whole community, rich and poor alike. The out patients are not treated dispensary fashion, but are sent up by appointment by their doctors, mostly for minor operations. This part of the work costs the hospital comparatively little, but it is of great value. Taking it all round, the system has been found to work very well in Bute, and, moreover, it is mainly in accordance with the plan for cottage hospitals laid down by the British Medical Association. In other localities, no doubt, some modification might require to be made. In large towns like Glasgow it has often seemed to me that many of the smaller dispensaries might be used in such a manner as we use our out-patient department. It is often of incalculable value for a practitioner to have access to a well-appointed place where he has the assistance of a nurse in order that he may examine or perform minor operations on his patients. It may be asked, How are the public to be induced to subscribe to such institutions when medical services are not wholly gratuitous? A community will soon come to recognize the extreme value of such an institution in its midst, and the public must be educated to see that it will get the best work out of the medical profession by paying fairly for its services, and by supporting a class of hospital which offers advantages to the many and is not the privilege of the few.

Vote of Thanks.—Dr. John Adams moved, and Dr. A. C. Munro seconded, a very hearty vote of thanks to Professor R. Stockman for the exceedingly able manner in which he had acted as President of the Branch. Professor Stockman suitably replied.

Smoking Concert.—A very enjoyable smoking concert followed the business meeting. Nearly a hundred members were present.

LANCASHIRE AND CHESHIRE BRANCH:

Blackburn Division.

A meeting of this Division was held at the Old Bull Hotel on June 21st. Dr. Moir occupied the chair. The following members were present: Drs. Henry, Burnham-Smith, Hogan, Butterfield, John Patchett, Aitken, Beaton, Heywood, Lees, Ballantyne, Jones, Taylor, Prebble, Johnston, Jeffrey Ramsay, Linton, Askins, Cran Duthie, and Greenwood.

Apologies for Non-attendance.—Apologies for non-attendance were received from Drs. Aitchison and Owen.

Confirmation of Minutes.—The minutes of the last meeting were read, confirmed, and signed by the Chairman.

Medical Treatment of Elementary School Children.—A discussion on the medical treatment of elementary school children was then opened by Dr. Greenwood. The following gentlemen took part in the discussion: Drs. Moir, Taylor, Jones, and Ballantyne. It was moved, seconded, and resolved:

That this subject be discussed again at a future meeting of the Division.

State Medical Relief of the Poor.—A discussion on the reorganization of the State medical relief of the poor was opened by Dr. Heywood. The following gentlemen took part in the discussion: Drs. Moir, Henry, and Greenwood. It was moved, seconded, and resolved:

That this subject be discussed again at a future meeting of the Division.

Voluntary Medical Charities.—A discussion on voluntary medical charities was then opened by Dr. Taylor, and Drs. Moir and Henry took part in the ensuing discussion. It was moved, seconded, and resolved:

That this subject be discussed again at a future meeting of the Division.

It was moved, seconded, and resolved:

That the Representative, Dr. Prebble, be instructed to vote in favour of the three resolutions passed at a meeting of the Blackburn Division on March 10th, 1910, respecting the report of the Poor Law Reform Committee of the British Medical Association with reference to medical matters, giving special attention to the resolution that the payment should be adequate and in accordance with the professional services rendered.

Burnley Division.

The annual meeting of this Division was held in the Bull Hotel, on Tuesday, May 31st. There was a good attendance of members; Dr. G. S. Pullon was in the chair.

Confirmation of Minutes.—The minutes of the previous meeting were read and confirmed.

Election of Officers.—The following were elected office-bearers for the ensuing year: *President*, Dr. F. E. Crossley; *Vice-President*, Dr. G. S. Pullon; *Honorary Secretary and Honorary Treasurer*, Dr. A. Edward Bird; *Representative for Representative Meeting*, Dr. J. M. Ferguson; *Branch Representatives*, Drs. F. E. Crossley and J. S. Wilson; *Executive Committee*, Drs. W. J. D. Bromley, A. Callam, A. A. Dickey, H. Edmondson, J. Howarth, J. Gardner, T. M. Scott, A. M. Sinclair, R. Stewart, J. S. Wilson.

Annual Report.—The HONORARY SECRETARY then read the annual report as follows: The annual report is again a matter for congratulation. The Division has been very much alive and active. Members to a great extent have shown interest in the working of the Association generally, and particularly in matters affecting directly or exclusively our own Division. The Division area includes Burnley, Brierfield, Barrowford, Barnoldswick, Colne, Hapton Nelson, and Padiham. The membership still shows an increase from 62 to 65. There have been seven meetings of the Division during the year, with an average attendance of 18 per meeting. The Executive Committee has met on nine occasions, with an average attendance of 8.2. It is to be regretted that since last summer the monthly report on current work of the Association has not been sent down from London. A matter has been raised in Burnley by the Federated Friendly Societies to establish a medical association of their own, to provide members and their families with medical advice and medicine. The Division did not neglect its duty, but immediately took steps to protect the medical profession. In this the Division was advised and supported by the Central Office of the Association, the BRITISH MEDICAL JOURNAL, and the *Lancet*. It is gratifying to know that from information gathered in the town this movement of the friendly societies is not gaining the approbation of all the members; but the societies' officials are still trying their best to induce them to adopt such a scheme. It has been decided that the Division shall treat all ambulance work as a matter of business and not philanthropy. This also applies to instruction in first aid and field nursing to voluntary detachments of the Territorial Forces, and a minimum fee of £1 1s. per lecture to a class not exceeding thirty members, was fixed. A code of ethics, together with general minimum charges, is to be printed at the expense of members and a copy sent to every member. This is being prepared. The code of ethics approved by the whole Division has not been sanctioned by the Central Ethical Committee. The Parliamentary candidates in the Division were interviewed and answered the set of questions most satisfactorily to the views of the profession. The Division has also been in communication with the local Midwives Supervising Committees regarding the payment of medical practitioners called in to assist midwives, but nothing definite has been settled. As was the case last year, again the Division joined with the local Medico-Ethical Society in providing a good syllabus of clinical meetings. These gatherings were fairly well attended, but it would be more gratifying if members generally would take more advantage of these edifying meetings. Some of the matters referred to Divisions which have been considered are: Employment of medical inspectors of school children; systems of payment of school medical officers; duties of school nurse in connexion with inspection and treatment; the treatment of school children found on inspection to be defective; special class of consultants; model rules of a public medical service; and many other matters. Two ethical cases have been brought before the committee during the year. The financial side of our Division is very gloomy. The Honorary Treasurer got a cheque from the Branch Secretary the other day for £3 4s. At the same time he received a bill from the printers for £6 2s. 3d. alone. How to make the less equal to the greater is a matter which must be submitted to the Branch. The Division has been honoured by the Branch deciding to hold its annual meeting in Burnley this year, and last year appointed Dr. Ferguson President-elect of the Branch. It is to be hoped that every member of the Division will do his utmost to make the meeting and the dinner in the evening a success. Most of the medical men in the district are now members of the Association—still there are a few who have not joined us. It would be an excellent thing if members who come in contact with those practitioners would not let them rest until they have induced them to become members of the Association. The fee will only be half now for the remainder of the year. It is now generally recognized that the profession has to face new legislature directly affecting the general practitioner, and some extremely important problems of State insurance against invalidity, Poor Law reform, etc., and if the Association can feel sure that it is backed up by the *whole* of the medical profession it can speak with no uncertain voice, and make its power felt to the future well-being of the general practitioner. But this can *only* be done by *union*.

Special Representative Meeting.—The meeting resolved to instruct its Representative to vote, in the Special Representative Meeting:

> That the Council be instructed to take all necessary steps with a view to the formation of a new company under the title of the British Medical Association, incorporated in the same manner as the existing company, but with a Memorandum of Association providing for all the objects which are detailed in Clause 2 of the draft Charter applied for by the Association.

It was resolved that the Representative use his own discretion in any matter on which he has not been instructed.

Nominations.—It was resolved that the Division give its official nomination to Mr. Larkin and Dr. Taylor for election by the Branch; and to Mr. Garstang for election by the Representatives in the 1910 election of Members of Central Council; at the same time recognizing their good services on the Central Council during the past year.

Votes of Thanks.—The Honorary Secretary was instructed to send the Division's thanks to the Directors and Honorary Secretary of the Mechanics' Institute for the kind offer of the free use of their exchange reading and news rooms, coffee room, chess, and billiard and smoke rooms, etc., to members of the Lancashire and Cheshire Branch at the annual meeting on June 15th. A similar vote of thanks was also to be sent to the Chairman and members of the Art Gallery Committee for their invitation to the members attending the Branch meeting to visit Towneley Hall and its grounds, and the summer exhibition of pictures and antiquities, etc.; and to Councillor E. Whitehead, J.P. (the Chairman) for extending his kind offer of "afternoon tea" to members visiting Towneley Hall.

Draft Model Rules of Division.—The Division adopted the Draft Model Rules of a Division (not itself a Branch) to regulate the procedure thereof in ethical matters, with the addition of Rule 14 to rules of the Burnley Division.

A MEETING of the Division was held on June 2nd. Dr. PULLON was in the chair, and twenty-five members were present.

Poor Law Invalidity and State Insurance.—Dr. J. H. TAYLOR gave an able address on Poor Law Invalidity and State Insurance. A discussion followed, and Dr. Taylor was heartily thanked for his address, and incidentally for the time and trouble he took in the work of the Association for the betterment of the general practitioner.

LIVERPOOL (CENTRAL) DIVISION.

THE annual meeting was held at the Liverpool Medical Institution on Wednesday, June 22nd. Dr. FRANCIS W. BAILEY, Vice-Chairman, occupied the chair, and there were present Frank H. Barendt (Secretary) and six members.

Apology for Non-attendance.—Dr. Palmer, the Chairman of the Division, intimated his regret at being unable to be present.

Election of Officers.—The following gentlemen were elected officers and members of the Executive Committee for the ensuing year: *Chairman*, Dr. Francis W. Bailey; *Vice-Chairman*, Mr. E. Malcolm Stockdale; *Secretary*, Dr. Frank H. Barendt; *Representative for Representative Meeting*, Dr. Thomas Bushby; *Representatives of Branch Council*, Drs. Thomas R. Bradshaw and Frank H. Barendt; *Executive Committee*, Drs. Sydney J. Palmer, N. Percy Marsh, F. J. Strong Heaney, and Messrs. R. W. Murray and A. Nimmo Walker; *Joint Committee of Combined Liverpool and Birkenhead Divisions.*—The following gentlemen were elected: Drs. T. Bushby and Frank H. Barendt (*ex*

officio), F. J. Strong Heaney, A. Gordon Gullan, and Mr. George P. Newbolt.

Report of Executive Committee.—The report was read by the SECRETARY, and it was resolved that an additional paragraph be appended emphasizing the importance of members taking more interest in the British Medical Association than they hitherto have done. The Secretary was instructed to circulate the report among the members.

Special Representative Meeting.—The suggestions of the Executive Committee arising out of the Agenda were submitted to the Division and unanimously adopted, and the Divisional Representative advised accordingly.

Annual Representative Meeting.—The Agenda previously discussed at length by the Executive Committee were considered, and Dr. Bushby was instructed accordingly.

Vote of Thanks to Retiring Officers.—Votes of thanks to the retiring officers were passed for their valuable services during the past year.

ST. HELENS AND WARRINGTON DIVISIONS.

A JOINT meeting of these Divisions was held on Monday, June 27th, at the Fleece Hotel, St. Helens. There were present: Drs. Buchan, Cotton, Dowling, Merrick, and Reid (St. Helens); Bowden, John Hutchinson, and Murray (Warrington).

Election of Officers.—Dr. Bowden (Vice-Chairman Warrington Division) was elected Chairman. Dr. F. P. Bassett (St. Helens) was unanimously elected Representative to the Representative Meeting 1910-11.

Election to Central Council.—It was unanimously resolved that the Representative (Dr. Bassett) be requested to support Dr. Garstang, a candidate for election to the Central Council.

Annual Representative Meeting Agenda.

23. Rider by Rochdale Division. Resolution:

That this meeting does not agree with this rider.

Passed unanimously.

47. Rider by Rochdale Division. Resolution:

That this meeting agrees with this rider.

Passed unanimously.

39 and 40. Ambulance, etc., Lectures. Resolution:

That this meeting agrees with these riders, and that a rider be added that any special circumstances under which it may be desired to vary this principle should be brought before the Division for consideration.

Passed unanimously.

SOUTHPORT DIVISION.

A SPECIAL meeting of this Division was held on June 24th at the Temperance Institute, Dr. SYKES in the chair. There were present: Drs. Ashworth, Baildon, Littler, Russel, Schofield, Walker, and Harris.

Apologies for Non-attendance.—Apologies for non-attendance were received from Drs. Lewis and Speirs.

Confirmation of Minutes.—The minutes of the last special meeting were read and confirmed.

Representatives at Representative Meetings.—A letter was read announcing that, in consequence of illness, Dr. Stanley A. Gill would be unable to act as Representative at Representative Meetings. Dr. HARRIS, who had been elected Deputy Representative, stated that an important engagement would prevent his attending the special meeting on June 28th, but that Dr. Baildon was willing to attend. It was consequently resolved unanimously:

That Dr. Baildon be elected Representative at the special meeting to be held on June 28th, and that Dr. Harris be the Representative at the Annual Representative Meeting on July 22nd and following days.

Special Representative Meeting.—The Agenda of the Special Representative Meeting was considered, and it was resolved unanimously:

That this meeting approves generally the report of the Council of the Association respecting the formation of a new company, but leaves the Representative to use his own judgement in voting at the special meeting to be held on June 28th.

Annual Representative Meeting.—The provisional agenda of the Annual Representative Meeting was considered, and it was resolved unanimously:

That the Representative at the Annual Representative Meeting use his own judgement in voting on all matters except in so far as decisions have already been recorded by the Division.

Election to Central Council.—It was resolved unanimously:

That the Secretary be instructed to nominate Dr. Garstang for election by the Representatives of the Lancashire and Cheshire Branch as a member of the Central Council, and that as Representative at the Annual Representative Meeting he be instructed to vote for him.

METROPOLITAN COUNTIES BRANCH:

CHELSEA DIVISION.

THE annual meeting was held on June 21st.

Election of Officers.—The following officers were elected for the ensuing year: *Chairman*, James Young, M.B. (2, Sherbrooke Road, Fulham, S.W.); *Vice-Chairman*, Campbell Boyd, Esq. (13, Sloane Court, S.W.); *Honorary Secretary and Treasurer*, J. R. Gallard, Esq. (512, Fulham Palace Road, S.W.); *Representative for Representative Meeting*, G. H. Coltart, M.B. (714, Fulham Road, S.W.), *vice* John Fletcher, M.B., resigned; *Representatives on Branch Council*, James Young, Esq., G. H. Coltart, Esq., J. R. Gallard, Esq.; *Executive Committee*, R. T. Bedford, Esq.: Wm. A. Bonney, M.D.; Campbell Boyd, Esq., H. J. Butler, Esq.; G. H. Coltart, M.B., J. Hamilton, M.D., W. S. Lee, Esq., P. H. Parsons, Esq.; D. A. Simon, M.B., M. J. Williams, Esq. At the extraordinary meeting of Representatives on June 28th, Dr. M. J. Williams, of 19, Jerdan Place, Walham Green, S.W., will act as deputy for Dr. O'Sullivan, of 39, Matheson Road, West Kensington.

HAMPSTEAD DIVISION.

THE annual meeting of this Division was held at 4.30 p.m., at the Hampstead Conservatoire, on Friday, June 24th, Mr. H. W. ARMIT in the chair.

Confirmation of Minutes.—The minutes of the last Divisional meeting were read and confirmed.

Election of Officers and Members of Committee.—The following officers were elected for the ensuing year: *Chairman*, Dr. Ford Anderson; *Vice-Chairman*, Dr. A. R. Oakley; *Honorary Secretaries*, Mr. W. P. Parsons and Mr. C. W. Cunnington; *Representative of the Division*, Mr. H. W. Armit (previously elected); *Deputy Representative*, Dr. H. Oppenheimer; *Representatives on Branch Council*, Dr. Coram James and Miss Dobbie. A ballot took place for the election of members of the Executive Committee, and resulted in the election of the following gentlemen: Drs. H. J. Macevoy, Claude Taylor, A. R. Roche, Percy Evans, F. E. Scrase, G. F. McLeary, C. J. MacFadden, E. E. Ware, A. W. Picard, and G. D. Pidcock.

Special Representative Meeting.—Motion 4: The proposal of the Cardiff Division was discussed, and the Representative was instructed to oppose this motion.

Instruction to Secretary.—The Secretary was instructed to call the attention of the Central Ethical Committee to the request of the Division to be heard before new ethical rules are formulated and recommended to the Divisions for their adoption.

Annual Representative Meeting.—Mr. ARMIT placed before the Division certain items in the agenda upon which he desired special instruction. Instructions were given as follows: To oppose Nos. 17, 21, and 23, riders by the Rochdale Division relating to alterations in the conduct of the JOURNAL, in the appointment of President, and in the rules relating to membership of the Association. To amend No. 25, rider by the Dundee Branch, so as to preserve the idea but provide a more suitable form of words in order to prevent resignation from the Association of a member whose conduct is likely to come under disapproval. To support No. 30, rider by the Dundee Branch (method of the transferable vote). To support No. 31, rider by the West Suffolk Division, in so far as the

principle is concerned, but to oppose the suggested method of carrying this out (enabling members to write their opinions for consideration at Divisional meetings). To support No. 34—the inadvisability of drafting regulations to govern a special class of consultants. No instructions were given on No. 49, as the Division is not in possession of information to guide it.

NORTH OF ENGLAND BRANCH:
NORTH NORTHUMBERLAND DIVISION.

THE annual meeting was held at the Infirmary, Alnwick, on Thursday, June 23rd, for the purpose of electing officers for the ensuing year. Dr. SCOTT PURVES occupied the chair, and there were present: Drs. Main, Moyse, Pringle, Robson, Burrow, Dey, and Burman. Dr. Beatrice Coxon was present as a visitor.

Apology for Non-attendance.—Apology for absence was received from Dr. Welsh of Amble.

Confirmation of Minutes.—The minutes of the last meeting were read and confirmed.

Election of Officers.—After being duly proposed and seconded, the following officers were appointed for the ensuing year: Dr. Dey was appointed Chairman, and Dr. Macaskie Vice-Chairman. Dr. Scott Purves having vacated the chair in favour of the new Chairman, Dr. Burman was reappointed Secretary, and the old Representatives on the Branch Council—namely, Drs. Robson and Maclagan—were reappointed. The following members were appointed to the Executive Committee: Drs. Moyse, Mackay, and Macdonald.

Public Medical Service.—The several officers having returned thanks on their appointment, the SECRETARY reported that, in accordance with the resolution passed at the last meeting, he had procured and forwarded to each member of the Division a copy of the Model Rules of a Public Medical Service, the consideration of which was deferred to a subsequent meeting.

Doctors and Midwives.—Acknowledgments of the receipt of the letter on the question of the payment of medical men called in by midwives from clerks of the county council (Midwives Committee) and other local authorities were read.

Proposed "Black List."—The question of the formation of a "Black List" was deferred pending the answer of the Central Ethical Committee to an inquiry by the Secretary as to the legal risks involved.

Treatment of School Children.—The question of the treatment of school children was reported on by the SECRETARY, and he announced that the matter was under the consideration of the Branch Council, and the result would be communicated to the members at the next meeting.

Fees for Ambulance Lectures.—A letter from a member regarding fees for ambulance lectures was read, and intimating that a medical man (not a member of the Association) had offered to conduct a class for half the amount agreed upon by the Division. The meeting expressed dissatisfaction with such conduct, and urged the Division to support those members who were insisting upon the fee of £5 5s. as a minimum.

Dr. Macaskie's "Notes."—The SECRETARY announced that the first instalment of Dr. Macaskie's Notes worth Remembering was now circulating among the members in alphabetical rotation.

Annual Representative Meeting.—The provisional agenda for the Annual Representative Meeting was considered. The SECRETARY OF THE BLYTH DIVISION announced his intention of calling a meeting for the purpose of electing a Representative of the combined Divisions of Alnwick, Blyth, and Morpeth at the Annual Representative Meeting on Friday, June 24th.

Invitations to Non-members.—The SECRETARY reported that members of the profession practising in the Division who had not joined the Association had been invited by him to do so, and forms of application for membership forwarded to them. The Secretary was requested to write to a member who had resigned and endeavour to retain his name in the list of members.

Annual Social Meeting.—An invitation was received from the Secretary and his wife to hold the annual social meeting at Bamburgh in September next as their guests. The invitation was accepted.

NORTH WALES BRANCH:
SOUTH CARNARVON AND MERIONETH DIVISION.

THE annual meeting of this Division was held at Dolgelley on Thursday, June 16th.

Election of Officers.—The following were elected officers for the ensuing year: *Chairman*, Dr. W. R. Williams (Machynlleth); *Vice-Chairman*, Dr. J. R. Jones (Penrhyndeudraeth); *Secretary*, Dr. H. Gladstone Jones (Plas Gwilym, Criccieth): *Representative to Representative Meeting*, Dr. W. R. Williams (Chairman); *Representatives on Branch Council*, Drs. J. W. Rowlands (Llanaelhaiarn), Hugh Jones (Dolgelley), H. Gladstone Jones (Criccieth), Richard Jones (Festiniog); *Members of the Executive Committee*, Richard Griffith (Portmadoc), Howel White (Corwen); *Representative North Wales Branch*, Dr. H. Jones Roberts (Penygroes).

OXFORD AND READING BRANCH:
OXFORD DIVISION.

THE annual meeting of the Oxford Division was held on Friday, June 24th, in the Masonic Buildings, Oxford, at 2.30 p.m.

Installation of New Chairman.—After luncheon, which was attended by eighteen members, Dr. CAUDWELL inducted the new CHAIRMAN, Dr. Turrell of Oxford, into the chair.

Vote of Thanks to Retiring Chairman.—A hearty vote of thanks was accorded Dr. Caudwell for his services as Chairman during the past session.

Confirmation of Minutes.—The minutes of the last meeting were read and confirmed.

Chairman's Address.—Dr. TURRELL (Chairman) gave an address on the Control of the Milk Supply in Towns in this Country. It was unanimously resolved that Dr. Turrell's address should be printed at the expense of the Division, and circulated to all members.

Report of Executive Committee.—The SECRETARY read the report of the Executive Committee on the work of the Division during the past session. In addition to the December and March meetings, there had been a special business meeting in May, arranged by the Branch, and held at Oxford; also the Tuberculosis Conference in October, held under the auspices of the Branch. All these meetings were well attended by members of the Division. The Committee wished to express their obligation to the Regius Professor of Medicine (Dr. Osler) and to Dr. Wingfield, of London, for opening discussions at the two ordinary meetings, as well as to other contributors to the agenda of these meetings. No disputes had arisen within the area of the Division requiring the assistance of the Executive Committee in their settlement. On Dr. Caudwell's invitation, the practice of collecting small subscriptions at the general meetings in aid of the British Medical Benevolent Fund had been established, and it was hoped it would continue. The report was accepted and adopted.

Balance Sheet.—The balance sheet was read and adopted.

British Medical Benevolent Fund.—On the motion of the CHAIRMAN, a collection was made for the British Medical Benevolent Fund (16s. 6d. being collected).

Election of Officers.—The following elections were then made: *Chairman-elect*, Mr. M. Styles (Moreton-in-the Marsh); *Divisional Representative*, Mr. Drew; *Secretary and Treasurer*, Dr. Duigan; *Two New Members of Executive Committee*, Dr. R. C. Yelf and Dr. Gibson.

Annual Representative Meeting.—The recommendation of the Executive Committee that Mr. Drew, Representative, be given a free hand at the Representative Meeting was adopted *nemine contradicente*.

The proceedings then terminated.

Dr. and Mrs. Turrell subsequently entertained the members to tea on the river Cherwell.

SOUTH-EASTERN OF IRELAND BRANCH.

A MEETING of this Branch was held in the Council Chamber, Town Hall, Clonmel, on June 10th, at 12 o'clock noon. The PRESIDENT (Dr. R. R. O'Brien) occupied the chair. The other members present were: Drs. P. J. Byrne, J. W. H. Jellett, Geo. Mackesy, T. O'Connell, J. D. Wymil, Lieutenant-Colonel Riordan, P. J. Murphy, D. Walsh, Joseph Power, and J. Quirke, Honorary Secretary.

Confirmation of Minutes.—The minutes of the last meeting were read, approved, and signed.

Apology for Non-attendance.—A letter from Dr. Laffan apologizing for non-attendance was read.

Foresters' Society and Medical Officers.—It was proposed by Dr. BYRNE and seconded by Dr. JELLETT:

> That Dr. Joseph Power be appointed to meet the Mayor of Clonmel with a view to discuss the question of the medical officers to the Foresters' Society, and that he be instructed that this Branch is of opinion that either an ample public apology be tendered to Dr. O'Brien, and published in the local press, or else that he be reinstated in his office as publicly as he was dismissed.

As the result of discussion which took place, the following amicable settlement was arrived at, namely:

> That the following note be inserted in the *Clonmel Chronicle* and other local newspapers:
>
> *Clonmel Foresters' Society and South-Eastern of Ireland Branch, British Medical Association.*
>
> A conference suggested by Mr. T. F. O'Brien, solicitor, with a view to ending a dispute between the above bodies was held on June 15th, 1910, Dr. J. Power (Ardfinnan) representing the Medical Association, and the Mayor of Clonmel representing the Foresters' Club. As a result we are happy to say that the dispute has been amicably arranged, and Dr. R. R. O'Brien has been reappointed Medical Officer to the Foresters' Club.

Vote of Thanks to Dr. Power.—It was proposed by Dr. JELLETT and seconded by Dr. MACKESY:

> That the best thanks of the meeting be conveyed to Dr. Power for so ably representing the Association at a conference with Mr. Sheehan, the Mayor of Clonmel, and having successfully brought the dispute to a satisfactory termination.

Instructions to Representative.—After a lengthened debate on the fifth item on the agenda paper, it was unanimously resolved:

> That Dr. Laffan be allowed to exercise his own discretion regarding the Royal Charter and the formation of a new Association, at the Special Representative Meeting to be held at London on June 28th, 1910.

Paper.—Dr. JELLETT read a most interesting paper on a case of suspected tuberculosis of the conjunctiva.

Vote of Thanks to the Mayor.—The meeting concluded with a unanimous vote of thanks to the Mayor and Corporation of Clonmel for the use of the Council Chamber.

Dinner.—The members dined at the Ormonde Hotel.

SOUTHERN BRANCH:

JERSEY DIVISION.

A GENERAL meeting of this Division was held on June 23rd. In the absence of the Chairman, Dr. P. B. BENTLIF presided.

Confirmation of Minutes.—The minutes of the last general meeting were read and confirmed.

Public Medical Service.—The report of the committee to which this question had been referred was read. That report was to the effect that, in the opinion of the committee, the scheme in question, whilst possessing certain merits, could not be recommended as suited to the conditions obtaining in Jersey at the present time. After discussion, it was resolved:

> That the conclusions of the committee be affirmed, and that the Division, whilst heartily appreciating the aims and labours of the Council in the matter, was not able, as at present advised, to support the scheme.

Special Report of Central Council.—This report, which was published in the BRITISH MEDICAL JOURNAL SUPPLEMENT of May 28th, was gone into carefully, and the proposals of the Council, consequent upon the withdrawal of the application for a Charter, were generally approved. A free hand, however, was given to the Representative of the Division in regard to the question when it should come before the Special Representative Meeting.

Communications.—A paper entitled, "Observations on Trance, with Notes of a Fatal Case," was read by Dr. H. C. MAJOR. A discussion followed.

ULSTER BRANCH:

PORTADOWN AND WEST DOWN DIVISION.

A MEETING of this Division was held at Lurgan on June 22nd. Dr. DEANE was in the chair, and fifteen members were present.

Election of Officers.—The following elections were made for the ensuing year: *Chairman*, Dr. Howard Sinclair; *Vice-Chairmen*, Drs. W. E. Hadden and Moore; *Secretary and Representative for Representative Meetings*, Dr. J. Singleton Darling; *Representatives on Branch Council*, Drs. S. Agnew, Lawless, and Taylor; *Executive Committee*, Drs. Deane, Simpson, McKee, S. E. Martin, Flood, Fergus.

Annual Report.—The annual report was submitted by the SECRETARY and adopted.

Fees for Insurance Examinations.—The report of the committee appointed at the last meeting to take a *plébiscite* of the members of the Division as to fees to be required from insurance companies was read and discussed, and the committee was reappointed with instructions to ascertain how many members would agree to abide by a minimum scale of fees assented to by the great majority of those who replied—52 per cent. of the members.

Address.—Dr. THOMAS HOUSTON, of Belfast, gave a most instructive and interesting address on the present position of treatment of tuberculosis by tuberculin. He was followed by Dr. SINCLAIR and other members. On the motion of Dr. MCKEE, seconded by Dr. SIMPSON, a hearty vote of thanks was passed to Dr. Houston.

Election of Honorary Member.—On the motion of Dr. AGNEW, seconded by Dr. DEENY, Dr. Houston was elected an honorary member of the Division.

Next Meeting.—At the request of Drs. MARTIN and BEAMISH the next meeting was appointed to be held in Newry in September.

WEST SOMERSET BRANCH.

THE sixty-eighth annual meeting of this Branch was held at the George Hotel, Ilminster, on Friday, June 24th, when there was a good attendance.

Induction of New President.—Dr. MAIDLOW, F.R.C.S., was inducted to the chair by the retiring President, Mr. C. Farrant.

Confirmation of Minutes.—The minutes of the last meeting were read and signed.

Annual Report and Balance Sheet.—The annual report and balance sheet were adopted.

Election of Officers.—Mr. W. B. Winckworth was elected President-elect, Dr. J. A. Macdonald was re-elected Representative, Mr. Winckworth was re-elected Honorary Secretary and Treasurer, and Dr. Balfour, of Chard, was elected to a vacancy on the council of the Branch.

Association Business.—A resolution was unanimously passed authorizing Dr. Macdonald, as Representative of the Branch, to support the alteration of the Articles and Memoranda of the Association on the lines suggested by the Organization Committee.

President's Address.—Dr. MAIDLOW read an address entitled "After Ten Years," which contained many original ideas and deductions, and in which he reviewed the additions and improvements which had taken place during the period named in many spheres of medical work and practice.

Vote of Thanks.—A cordial vote of thanks was given to Dr. Maidlow for his address, on the proposition of Mr. C. J. MARSH, seconded by Mr. C. FARRANT, and the hope was expressed that the paper would be published.

YORKSHIRE BRANCH.

THE annual meeting of the Branch was held at the University of Sheffield on Wednesday, June 22nd, at 4 p.m. Dr. GODFREY (President) was in the chair, and thirty-seven other members were present.

Confirmation of Minutes.—Dr. BRONNER (Honorary Secretary) read the minutes of the previous annual meeting, which were approved and adopted.

Election of Officers.—The election of officers for the next year then took place. Dr. EDDISON (Leeds) proposed, and Dr. DYSON (Sheffield) seconded, that Mr. R. J. Pye Smith (Sheffield) should be President for the ensuing year. This was carried with acclamation. Dr. GRIFFITH (Leeds) proposed that Dr. Churton (Leeds) should be President-elect. This was seconded by Dr. SOLLY (Harrogate) and carried. Dr. CAMERON (Leeds) proposed, and Dr. MOSSOP (Bradford) seconded, the re-election of Dr. Bronner as Honorary Secretary and Treasurer. On being put to the vote this was carried by acclamation.

Annual Report of Branch Council.—The HONORARY SECRETARY then read the annual report of the Branch Council on the past year's work: During the year three meetings have been held—at Bradford, Scarborough, and Halifax. At the annual meeting held at Scarborough, Dr. Godfrey was elected President, and it was decided to hold the next annual meeting at Sheffield. Mr. Pye-Smith was elected President elect. The average attendance has been 35. Only 64 new members have been added—30 by election, 24 by change of address, and 10 by change of boundary. Seventy-one members have been lost by death and resignation, making a net decrease of 7 members. Owing to the largely increased expenses of the London office, the capitation grant to the Branches has been reduced from 4s. to 2s. per head. The full amount received has been remitted to the Divisions (in three cases more than the full amount), which accounts for the reduced balance in hand. We began the year with a balance of £180 10s. Receipts, £99 2s. 4d.; grants to Divisions, £105 10s. 6d.; Branch expenses, £29 12s. 6d.; balance in hand, £141 10s. 6d. The Branch has sustained severe losses by the death of three prominent members: Mr. Snell, whose death while occupying the position of President of the Association, was greatly deplored, not only by the Branch, but by the whole of the Association. By the death of Dr. Wheelhouse the Branch has lost one of its oldest members. Though he had lived in retirement for many years, he was held in affectionate remembrance by many of the older members of the Branch. Dr. Kilner Clarke, a past-President of the Branch, took an active part in the work of the Association. The Wakefield and Doncaster Division has been reorganized, and now has fifty-eight members. The Council suggest that the next annual meeting be held at Leeds, and that Dr. Thomas Churton be elected President-elect. On the proposition of the PRESIDENT, seconded by Dr. METCALFE (Bradford), this was adopted. Dr. BRONNER, in explaining that the allowance from the Central Body for Branch and Divisional expenses had been reduced to 2s. per member, drew attention to the fact that any active Division that required further funds for any special purpose could obtain them by making the necessary application.

President's Address.—The PRESIDENT then read his address (which will be published). At the conclusion of the address, Dr. EDDISON moved that a hearty vote of thanks should be accorded to Mr. Pye-Smith. Mr. Pye Smith had touched on numerous questions that were most important to them all. Dr. GODFREY seconded, and on being put to the meeting it was carried unanimously.

Installation of New President.—Dr. GODFREY, the retiring President, then vacated the chair. He said he would make way for a better man, and one who would look after and foster all the interests of the Branch and their great Association. Mr. Pye-Smith was too well known in Sheffield for him to say anything further about him.

Election of Dr. Godfrey as a Permanent Vice-President.—Dr. GORDON BLACK (Harrogate) proposed that Dr. Godfrey should be elected a permanent Vice-President of the Branch. He had given them a most interesting address a year ago, and had been an ideal President. All would wish him good health and prosperity, and thanked him for his work during the past year. Dr. MARTIN (Sheffield) seconded. He had known Dr. Godfrey for many years, and knew that all the good things that had been said of him were deserved. The motion was carried. Dr. GODFREY thanked the members for their vote and for the honour they had done to him in electing him Vice-President of the Branch. His year of office had been a real pleasure to him, although he did not think he had done all he might have accomplished in the chair. He wished to cordially thank the officials, the council, and the members of the Branch for the cordial way in which they had supported him.

New Articles of Association.—Dr. CARTER (Sheffield) then moved the following resolution:

> That this meeting is disappointed to see no reference to a postal referendum in the proposed new Articles of Association, and expresses its opinion that no new articles will be satisfactory which do not provide for a postal referendum either on a simple majority vote in the Council or on the requisition of a certain proportion of members, Divisions, or Branches, as recently discussed between the Organization Committee and certain members with reference to the Draft Charter.

Dr. GRIFFITH (Leeds) seconded. The resolution was carried.

Cases and Specimens.—Dr. ARTHUR HALL (Sheffield) showed the following cases: (1) Neuro-fibromatosis (Von Recklinghausen's disease); (2) diabetes insipidus in two childless brothers. Dr. SKINNER (Sheffield) showed: (1) Parakeratosis psoriasiforme, with histological note; (2) furunculosis with subsequent lichenification, with section.

Papers.—Dr. CARTER (Sheffield) read notes on a case of Stokes-Adam's disease. The PRESIDENT thanked Dr. Carter for his paper. Cases such as he had described were very rare. He asked if any sphygmographic tracings had been made of the pulse. He desired to draw attention to the great relief obtained in the sort of flatulency mentioned if the patient were moved up when lying on her back. Dr. RABAGLIATI (Bradford) said that he had heard the description of the case with the greatest interest. Apparently very little improvement had resulted from treatment. In his opinion this kind of case was often seen, especially with a very slow pulse. The feeding had no doubt been of a wrong character for a long period before the actual illness. He suggested the application of a hot poultice to the epigastrium every morning and evening; and, with regard to diet, simply a hot drink, such as tea or milk, in the morning, about mid-day a mutton chop, and in the evening again a hot drink. A limited dietary of this description for six or eight weeks would probably materially improve the patient's condition. Dr. LONGBOTTOM (Sheffield) said that he was very interested in hearing the recital of the case by Dr. Carter. He had a very similar case under treatment. The radial pulse sometimes stopped for ten or twelve seconds—in fact it appeared at times as if the heart had stopped altogether. The beat was frequently only eighteen to the minute. He had found that most relief was obtained by the hypodermic injection of morphine. Dr. Rabagliati's suggestions were most interesting, and he would bear them in mind. Dr. CARTER replied. He thanked Drs. Rabagliati and Longbottom for their remarks. In answer to the PRESIDENT, he had not made sphygmographic tracings. He had found that it was necessary to raise the patient up to get relief from the flatulency. The treatment had been chiefly by belladonna in full doses, but glonoin and other drugs had also been used. He did not think he could have done anything further in regard to diet. The patient was a total abstainer and light eater. She had been given white fish, fruit, bread and butter, etc., and had been reduced 1 st. in weight by her dietary.

Intranasal Treatment of Asthma and Hay Fever.—Dr. BRONNER (Bradford) read a paper on Notes on Some Cases of Asthma and Hay Fever Cured by Intranasal Treatment. He gave a short summary of the

various theories of the causation of asthma and hay fever. There was no doubt that asthma was, in a large number of cases, due to intranasal irritation. Often the mucous membrane of the nares was apparently normal, but on careful examination certain areas were found to be hypersensitive. These areas were generally situated on the anterior and middle parts of the lower turbinates, and near the tubercle of the septum. If these areas were treated with a large, flat, hot cautery point, the attacks of asthma often ceased, or became less acute. The cautery points generally used were much too small. A solution of 10 per cent. cocaine and 1 in 1,000 adrenalin chloride applied to these parts for ten to fifteen minutes rendered the operative treatment practically painless. The same treatment was useful in many cases of hay fever. Of course, general treatment was often necessary, especially in cases of hay fever and vasomotor rhinitis. If there was any nasal obstruction (spurs, polypi, deviated septum), this should, of course, be removed. Every case of hay fever and asthma which did not yield to the ordinary methods of treatment should be carefully examined, and the nares, if necessary, treated. If this were systematically done at the early stages of the disease, many of these most distressing cases could be cured, or at least relieved. Of course the longer the patient had suffered from asthma, especially if the lungs had become affected, the more difficult was it to cure the asthma. Numerous cases of hay fever and asthma cured, or relieved, by intranasal treatment were recorded. The PRESIDENT said he had listened to Dr. Bronner's paper with the greatest interest, and must thank him for bringing the subject before the Branch. The time had, however, arrived for bringing the meeting to a close, and unfortunately no further discussion could take place.

The meeting then terminated.

Association Notices.

ELECTION OF MEMBERS OF COUNCIL BY GROUPED REPRESENTATIVES.

NOTICE is hereby given that Nominations for candidates for election of Members of Council by Grouped Representatives for the year 1910-11 will be received by the Medical Secretary up to the end of the first hour of the proceedings of the Annual Representative Meeting on Monday, July 25th, 1910. Each Nomination must be on the prescribed form, copies of which will be forwarded by the Medical Secretary upon application.

Separate forms have been prepared (1) for Nomination by a Division and (2) for Nomination by a Representative of a Division included in the Group, and those applying are requested to state for which purpose the form is desired.

The voting papers will be issued at the Representative Meeting to each Representative or Deputy Representative of a constituency in the United Kingdom, in attendance at the Meeting.

By Order of the Council,
J. SMITH WHITAKER,
Medical Secretary.

NOTICE OF THE FORMATION OF A NEW DIVISION OF THE ASSOCIATION.

Manawatu and West Coast Division.

THE following change has been made in accordance with the Regulations of the Association, and takes effect from the date of publication of this notice:

The members of the Association, resident in the district comprising the counties of Horowhenua, Manawatu, Kairanga, Oroua, Pohangina, Kiwitea, Rangitikei, Wanganui, and Waitotara, at present forming part of the Wellington Division (New Zealand Branch), are constituted a Division of the Association designated the Manawatu and West Coast Division.

BRANCH AND DIVISION MEETINGS TO BE HELD.

NORTHERN COUNTIES OF SCOTLAND BRANCH.—The annual meeting of the Branch will be held at the Imperial Golf View Hotel, Nairn, on Saturday, July 16th, at 11.30 a.m.—J. MUNRO MOIR, Honorary Secretary.

NORTH WALES BRANCH.—The sixty-first annual meeting of the Branch will be held at the Hand Hotel, Llangollen on Tuesday, July 12th, at 2 p.m. Luncheon at 1 p.m. punctually; tickets, 3s. The Branch Council will meet at 1.45 p.m. Agenda: (1) To read the minutes of the last meeting. (2) To read correspondence. (3) To introduce the President-elect. (4) To receive the report of the Branch Council. (5) To elect President for 1911-12. (6) To elect Honorary Secretary. (7) To report election of members on Branch Council. (8) To select place of meeting for 1911. (9) To consider a letter received from the Secretary of the Research Defence Society. The President will deliver his address. The following papers, etc., will be read:—Mr. E. D. Evans: (1) Short notes of a case illustrating the rôle of entozoa in the etiology of appendicitis; (2) Short notes of two cases of *Bacillus coli* infection during the puerperium. Dr. H. Drinkwater will show radiographs of brachydactylous hand and foot. Dr. H. Jones Roberts: Note on a case of radical cure of hernia. Dr. W. Blair Bell: Some points in regard to the diagnosis and treatment of cancer of the cervix. Dr. N. Percy Marsh: Infant feeding in difficult cases. Mr. G. B. Newbolt: Non-union and delayed union in fractures of the leg. Dr. R. J. M. Buchanan: (1) Auscultation and tuning-fork vibration; (2) Pulmonary affections and syphilis. Mr. W. Thelwall Thomas: Ureteral calculi (with specimens and rays). Dr. J. Lloyd Roberts: Some cases of mediastinal tumour. Dr. C. J. Macalister: Note on some therapeutic applications of pituitary extract.—H. JONES ROBERTS, Honorary Secretary, Penygroes, S.O.

SOUTHERN BRANCH.—The annual meeting of this Branch will be held at the Infirmary, Salisbury, on Thursday, July 14th, at 12.45.—J. OGDIN MARSH, Honorary Secretary.

British Medical Association.

NOTICE OF EXTRAORDINARY GENERAL MEETING.

NOTICE IS HEREBY GIVEN by the Council that, the following Resolution having been passed by the requisite majority at an Extraordinary General Meeting of the above-named Association, at the Connaught Rooms, Freemasons' Hall, Great Queen Street, London, on Wednesday, the 29th day of June, 1910, a further Extraordinary General Meeting of the above-named Association will be held at the Court of Common Council Chamber, Guildhall, London, on Friday, the 22nd day of July, 1910, at 2 o'clock in the afternoon, for the purpose of receiving a Report of the proceedings at the above-mentioned Meeting, and of confirming, if thought fit, as a Special Resolution the Resolution here set forth:

"That the Regulations contained in the printed document submitted to this Meeting, and for the purpose of identification initialled by the Chairman thereof, be and the same are hereby adopted as the Regulations of the Association in substitution for all the existing Regulations of the Association."

Dated this 30th day of June, 1910.

BY ORDER,
GUY ELLISTON,
Financial Secretary and Business Manager.

BRITISH MEDICAL ASSOCIATION LIBRARY.

BOOKS NEEDED TO COMPLETE SERIES.

THE Librarian will be glad to receive any of the following volumes, which are needed to complete series in the Library:

Asylum Journal of Mental Science. Vol. 1, 1854.
Bentley and Trimen. Atlas of Medicinal Plants.
British Journal of Dermatology. Vol. 2, part 3.
British Laryngological and Rhinological Association, 1896-7-8-9, 1900, and since 1903.
Caledonian Medical Journal. Vol. 1 prior to 1894.
Carmichael Essays. Rivington, 1879.
Centralblatt für Augenheilkunde. Hirschberg. All prior to 1891; Index to 1891.

British Medical Association.

SEVENTY-EIGHTH ANNUAL MEETING, LONDON, JULY 22nd–29th, 1910.

GENERAL ARRANGEMENTS.

THE Central Offices, Reception Room, and Sectional Meeting Rooms will be established in the University of London, the Imperial Institute, and the Imperial College of Science at South Kensington.

NOTIFICATION OF ATTENDANCE: RAILWAY TICKETS.

All members of the British Medical Association who purpose to attend the Annual Meeting in London at the end of this month, including those resident in London, are requested at once to fill up, if they have not already done so, the form of "notification of attendance" which appears in to-day's issue amongst the advertisements on pp. 9 and 10. If the form is filled up and returned to the address shown, a voucher or vouchers will be issued from the Central Office, 429, Strand, giving the right to the special terms which have been arranged with the railway companies. The companies will issue return tickets at a single fare and a quarter, available from July 21st to August 2nd, both dates inclusive.

LIST OF HOTELS AND LODGINGS.

A list of hotels and lodgings, with a scale of charges, was published in the SUPPLEMENT of June 18th, p. 406. Members are requested to communicate direct with the persons whose names are given in the list, or with the managers of the hotels mentioned.

GUIDE BOOK.

A short guide book has been compiled for distribution to members attending the Annual Meeting. It gives a brief sketch of the history of the medical institutions of London, and a general survey of the developments in scientific and practical teaching in the various schools, and of the enlargements and other changes of the hospitals and other medical institutions of the metropolis during the fifteen years that have elapsed since the British Medical Association held its Annual Meeting in London in 1895. The booklet also contains all the information necessary to enable members to find their way to the museums and other places likely to be of special interest to them. For this purpose the means of locomotion—by omnibus, tramway car, electric and tube railways—are described; and further help to the visitor in threading the labyrinth of London is given by diagrams and a coloured map.

RECEPTION ROOM.

The Reception Room will be established in the University of London and Imperial Institute, South Kensington. The University may be conveniently reached by electric tube or Underground Railways (South Kensington Station), or by omnibuses traversing Piccadilly. Copies of the *Daily Journal* will be obtainable, as well as full particulars of entertainments and excursions. Guide books, time-tables, and other works of reference will be provided, and there will be a postal office for the receipt and dispatch of letters and telegrams. There will be writing and reading rooms, and a typewriting office; a typewriting office will also be established in the Imperial College of Science. Accommodation will be arranged for members desiring to smoke.

LUNCHEONS.

Luncheons will be provided daily in the Quadrangle of the Imperial Institute. Messrs. Stewart and Co., the caterers at Brooklands, have been appointed, and luncheons will be served at 2s. a head.

CLUB ACCOMMODATION.

The Club Accommodation Subcommittee of the Reception Committee beg to announce that a limited amount of accommodation has been offered to members of the Association and foreign visitors to the forthcoming Annual Meeting.

Those desirous of availing themselves of this club accommodation are requested to send in their names on the accompanying form, addressed to the Chairman of the Subcommittee, Dr. Maurice Craig, 429, Strand, W.C., on or before July 11th.

Application Form for Club Accommodation.

Name and titles .....

Address .....

....

*Clubs of which applicant is a member..... ..... (social and otherwise)

* This is for introduction purposes to the London club.

POST, TELEGRAPH, AND TELEPHONES.

Letters and Telegrams.

Full postal facilities for the receipt and dispatch of letters and telegrams will be provided in the Post-office which will be established in the Reception Room, University of London, South Kensington, S.W.

Telephones.

Two telephones will be available for the use of members in the Reception Room, and one in the Imperial College of Science.

SPECIAL SERVICE IN WESTMINSTER ABBEY.

The service in Westminster Abbey will be held at 3 p.m., on Wednesday, July 27th. The sermon will be preached by the Very Rev. the Dean of Salisbury. Special tickets of admission will be necessary, and as the accommodation is limited, early application for tickets to be reserved should be made to Dr. W. Griffith, 1, Chester Gate, N.W. Separate tickets admitting to the Abbey by different entrances will be issued to—

1. Men intending to wear academic costume (Form A).
2. Women intending to wear academic costume (Form B).
3. Men or women *not* intending to wear academic costume (Form C).

Robing rooms will be provided within the precincts of the Abbey. Members should therefore specify in their application which form of ticket they desire.

The final allotment of tickets will be made on Tuesday morning, July 26th, and tickets not previously forwarded by post will be issued in the Reception Room, University of London, South Kensington, on personal application.

This form of application may be cut out and used.

I wish to attend the service in Westminster Abbey, and shall be glad to have reserved for me, if available, a ticket of

Form { A* / B* / C*

If my ticket is forwarded by post please send it to the following address:

Name.....

Address.....

* For explanation of letters see above. Please strike out the two letters not required.

Special Service at Westminster Cathedral for Roman Catholic Members.

By the kindness of the authorities of Westminster Cathedral, special front places will be reserved at the Solemn High Mass at 10.30 a.m., or Vespers at 3 p.m., for as many Members of the British Medical Association as desire to attend either of these services on Wednesday, July 27th, and will notify their intention of being present. Special tickets will not be necessary, but members who desire to be present are asked to send a postcard intimating their intention to Dr. Finucane, 10, Ashley Place, S.W., so that a sufficient number of seats may be reserved.

ENTERTAINMENTS AND EXCURSIONS.

Special Notice.

Members are earnestly requested not to make application for tickets for functions unless they are confident of being able to attend, and to return IMMEDIATELY *any ticket allotted to them which they find themselves unable to use.*

Entertainments in London.

Annual Dinner of the Association.

The annual dinner of the Association will take place at the Connaught Rooms, Freemasons' Hall, Great Queen Street, W.C., on Thursday, July 28th, at 7.30 p.m. punctually.

The price of the dinner ticket is 10s. 6d., exclusive of wines. As the accommodation is limited, those desirous of attending should make early application to Mr. Atwood Thorne, 429, Strand, London. The necessary form of notification is published in the advertisement pages 9 and 10.

Ladies' Dinner.

A dinner for ladies accompanying those Members of the Association who are attending the annual dinner will take place at the Hotel Cecil on the same evening. Members attending the annual dinner and who are accompanied by a lady should advise Mrs. Mary Scharlieb, M.S., M.D., 149, Harley Street, London, if they desire to obtain an invitation for the ladies' dinner. A reception at the Lyceum Club has also been arranged.

Receptions.

A reception will be given at the Guildhall by the Corporation of the City of London, at 8.30 p.m. on Wednesday, July 27th, for which special tickets of admission will be required.

A reception will be given by the Metropolitan Counties Branch, at the Natural History Museum, Cromwell Road, South Kensington, on the evening of Friday, July 29th, for which 4,000 invitations will be issued.

A reception will be given at the Royal Army Medical College, Millbank, when a demonstration illustrating the equipment of foreign armies will take place.

Academic Dress.

Academic dress or uniform will be worn at the General Meeting at St. James's Hall, Great Portland Street, on Tuesday, July 26th, at 8.30 p.m., when Mr. Butlin will deliver his presidential address, and foreign guests and Colonial delegates will be presented and honorary members inducted.

Academic dress will also be worn at the service in Westminster Abbey on Wednesday afternoon, July 27th, at 3 p.m., and at the conversazione on Wednesday evening, July 27th, given by the Lord Mayor and Corporation of London at the Guildhall.

It is desired also that academic dress should be worn at the evening reception to be given by the Metropolitan Counties Branch at the Natural History Museum on Friday evening, July 29th.

Garden Parties.

The President and members of the Metropolitan Counties Branch will give a reception and garden party to 4,000 members and their friends in the picturesque Polo Grounds of the Ranelagh Club on the afternoon of Thursday, July 28th; for this also special tickets will be required.

The President, Treasurer, and Governors of the Royal Hospitals of Bridewell and Bethlem will entertain 500 at a garden party at Bethlem Royal Hospital on Wednesday afternoon, July 27th, for which special tickets will be required.

A luncheon and garden party will be given at St. Bartholomew's Hospital on Wednesday, July 27th.

Ladies' Reception Committee.

The Ladies' Reception Committee are making extensive arrangements for the entertainment of ladies accompanying members attending the Annual Meeting in London. In addition to the dinner mentioned above, arrangements have been made for several mornings and afternoons. On Tuesday, July 26th, visits will be made to the Sesame Training Home, Passmore Edwards Settlement, the School of Medicine for Women, and St. Paul's Cathedral; the visit to the School of Medicine for Women will take place at 11 a.m. On Tuesday afternoon Stafford House will be visited. On Wednesday morning visits will be paid at Apsley House, and at 11.30 a.m. to Westminster Abbey; in the afternoon Mrs. D'Arcy Power will conduct a party of seventy ladies and gentlemen over Barbers' Hall and St. Bartholomew's Priory. The party will be met in the square of St. Bartholomew's Hospital, West Smithfield, at 1.30 p.m., and will proceed to the Priory Church of St. Bartholomew's the Great, which is one of the oldest and most interesting in London. The Barbers' Hall in Monkswill Street, which is rarely open to the public, will be inspected at 3 o'clock by the kind permission of the Master and Wardens of the Barbers' Company, and a short sketch of its history and its relation to the development of British medicine will be given. Mrs. D'Arcy Power will be at home at 10A, Charles Street, Cavendish Square. Tea at 5 o'clock. The distance to be walked during the afternoon is under a mile. On Thursday a visit will be made to the Tower at 11 a.m., and Miss Scharlieb will conduct a party over the Charterhouse and St. Giles's, Cripplegate. On Friday at noon a visit will be paid to Grosvenor House. The Chairman of the Committee is Mrs. Rose Bradford, and inquiries only concerning these may be addressed to the Honorary Secretary, Mrs. Dudley Buxton, 82, Mortimer Street, W. All applications for tickets must be sent to 429, Strand, W.C.

Visits to Private Mansions.

By the kindness of the Dukes of Wellington, Westminster, and Sutherland, arrangements have been made for small parties of about twenty-five to visit the following mansions, which contain fine collections of pictures and other objects of interest:

Apsley House, the residence of the Duke of Wellington.

Grosvenor House, the residence of the Duke of Westminster.

Stafford House, the residence of the Duke of Sutherland.

Visits to Various Places of Interest.

Members will have an opportunity of visiting the Royal Mews, Buckingham Palace, by kind permission of Sir Henry Ewart, Master of the Horse; special tickets will be required.

The new premises of the Royal Sanitary Institute, Buckingham Palace Road, will be open to members, who will be conducted over the Parkes Museum and the Institute.

The Society of Medical Officers of Health will throw open their rooms (1, Upper Montague Street, Russell Square) to members throughout the day, and provide tea between 4 and 5 o'clock. Admission by member's card.

Visits to the Tower of London have been arranged, and parties will be conducted by special warders.

Visits may also be made to the Royal Mint.

Visits to the various docks have been arranged by permission of the Port of London Authority.

A visit to the offices and printing works of the *Daily Telegraph* has been arranged.

The National Telephone Company will show its exchange station to members.

Members are invited to visit the Zoological Gardens on Sundays, July 24th or 31st. Application must be made for special tickets to 429, Strand, W.C. Representatives and Members of Council can obtain tickets for July 24th on application to Dr. Rowland Fothergill, Torquay House, Southfields, S.W.

EXCURSIONS.

Friday, July 29th.

ST. ALBANS.

The Mayor of St. Albans (Dr. E. H. Lipscomb) has invited a party of fifty members to St. Albans, where they will be shown over the cathedral and entertained by him to luncheon. Members will leave by the 12.15 or the 1 5 train from St. Pancras Station, which can be most speedily reached from the University by travelling by the Piccadilly electric tube railway from South Kensington Station.

Saturday, July 30th.

LORD MAYOR TRELOAR CRIPPLES' HOME AND COLLEGE.

Sir William Treloar has invited a party of 200 members to visit the Cripples' Home and College at Alton, Hampshire. A special train will leave Waterloo at 10.5 a.m., and will arrive at the platform in the grounds of the institution at 11.23; a return train will leave the same platform at 4.35, and is due to arrive at Waterloo at 5.54. The visitors on arrival will be conducted over the institution in separate parties by the sisters. Luncheon will be served in the grounds at 1 p.m. and tea at 4 p.m. After luncheon Sir William Treloar will give a short address, and papers will probably be read by members of the medical advisory board and by the medical superintendent, who will give a demonstration on the use of plaster-of-Paris.

BATH.

The Mayor and Corporation of Bath have invited 200 members to visit the city of Bath. The Corporation will arrange for conveying the members of the party to and from London in special trains from Paddington Station, and will entertain them at luncheon. The programme will include a visit to the hot mineral bathing establishments and a drive round the city. (The leading hotels are prepared to offer special terms to any member of the party desirous of staying the week-end in Bath.)

EASTBOURNE.

The Eastbourne Division has invited 100 members to visit Eastbourne, where they will be entertained to luncheon, and will make an excursion to Beachy Head.

BRIGHTON AND HOVE.

The Corporations of Brighton and Hove will invite 100 members to visit these sister towns. After driving round the town of Hove, inspecting the Bath on the King's Esplanade, and visiting the St. Anne's Well Gardens, there will be an Official Reception and Public Luncheon at the Hove Town Hall. The luncheon is timed to take place at 1.45, after which the party will proceed to the Royal Pavilion, Brighton, where the Mayor of Brighton will receive them and entertain them to a garden party.

WINDSOR.

The arrangements have not yet finally been made, but there will probably be an excursion to Windsor to visit Windsor Castle and Eton College, and an excursion by train to Maidenhead, thence to Henley by launch, and return by train.

Members who have already notified their intention to attend the Annual Meeting will assist the Executive by filling up the following forms indicating which of the functions and excursions, of which particulars are given earlier in this article, they prefer to take part in. The forms, when filled up, should be addressed to Dr. Lauriston Shaw, 429, Strand. In the allotment of tickets, the numbers of which are limited, preference will be given to those who make early application. The allotted tickets will be retained by the Committee, and given out on personal application in the Reception Room, University of London, South Kensington, during the meeting.

I.

I should be glad to have an opportunity of attending the following functions, and have numbered them in order of my preference:

Order of Preference.	—
.....	The President's Address.
.....	The Corporation's Reception.
.....	The Metropolitan Counties Branch Reception.
.....	The Garden Party at Ranelagh
.....	The Garden Party at Bethlem Hospital.
	Applications for tickets for the Special Service in Westminster Abbey, the Annual Dinner, and for the various excursions should be made on the separate forms provided.

Name.....

Address.....

II.

I should be glad to have an opportunity of joining one of the following excursions, and have numbered them in order of my preference:

Order of Preference.	—
.....	Sir William Treloar's Cripples' Home.
.....	Bath.
.....	St. Albans.
.....	Eastbourne.
.....	Brighton and Hove.
.....	Windsor.

Name.....

Address .....

GOLFING.

The Ulster Cup.

A letter from Dr. F. J. Smith explaining the arrangements made for this annual competition, which is to take place at Burhill on Friday, July 29th, was published in the JOURNAL of July 2nd, p. 53.

It will be remembered that a cup was presented by the Ulster Branch last year, and is to be played for annually on the following conditions, as laid down by the Ulster Branch:

Bogey play under handicap, not exceeding 18; cup to become the property of the member of the Association winning it twice in succession, or three times in all; one round of 18 holes to be played on one day at the Annual Meeting, with no previous play.

The cup is a copy of the famous Ardagh Cup, which is in the National Museum in Dublin, and whose history is known from the eleventh century.

Dr. F. J. Smith gives notice that entries for the cup must reach him at 138, Harley Street, W., not later than Friday, July 15th. The links of the Burhill Golf Club are near Walton-on-Thames Station, which is easily reached from Waterloo Station, and Waterloo is itself easily and quickly reached from most parts of London by the Baker Street and Waterloo Tube railway, which has communications with the Central London Railway at Oxford Circus and with the Piccadilly Railway at Piccadilly Circus.

As will be seen from Dr. F. J. Smith's letter, the officers of the Burhill Golf Club have extended their hospitality a good deal beyond the arrangements for the Ulster cup competition, for they have offered the following additional facilities:

1. They have offered to make all members of the Association attending the annual meeting temporary members of the club for the Wednesday, Thursday, and Friday of the meeting.
2. They have, in the name of the Burhill Club, offered one, if not five, extra prizes for competitions to be determined later.
3. There are two courses at the club, so that possibly four-somes can be played after the competition proper is finished, or even simultaneously with it.

4. There will be an unlimited putting competition during Friday—cards, 6d. each—the pool to be divided in proportions to be determined later.
5. They have placed at the disposal of visiting members the catering establishment of the club, so that those who wish to do so can dine there in the evening at a reasonable cost.
6. There is ample accommodation for ladies, who can, at any rate, take out as many cards as they like for the unlimited putting competition, or, indeed, arrange one for ladies only.

Members intending to compete for the Ulster cup or in any other competitions will be required to furnish a certificate of their handicap signed by the club secretary. Further details, including the starting time, which must be strictly adhered to, will be posted in the Reception Room at the University of London, South Kensington, during the meeting.

Annual Match.

The usual annual match will take place on Wednesday afternoon, July 27th. It will be between the Metropolitan Counties Branch and the visitors, and it is hoped that at least twenty a side will take part. It will be played, by the kindness of the committee, on the well-known Northwood Links. All members who wish to play are asked to send their names at once to Mr. Percy Furnivall, 28, Weymouth Street, Portland Place, W., in order that the best selection available may be made. It is particularly requested that names should be sent in as early as possible, and each should be accompanied by the player's club and lowest handicap.

Honorary Membership of Clubs.

The following clubs have invited members to use their links: Acton, Ashford Manor, Burnham Beeches, Bushey Hall, Burhill, Edgware, Eltham Warren, Fulwell, Hanger Hill, Home Park, Mid-Surrey, Neasden, Princes', Richmond, Romford, Sandy Lodge, Sunningdale, Totteridge, Tooting Bec, Walton Heath, Wembley, West Middlesex, Royal Wimbledon, and Worplesdon.

Arrangements will be made by which members wishing to play a round may leave their names and handicaps at the Reception Room not later than the day before, in order that matches may be arranged.

ANNUAL REPRESENTATIVE MEETING.

A committee of the Metropolitan Counties Branch has issued a circular to Representatives of Divisions and members of the Central Council showing the arrangements which have been made for the entertainment of the members of the Representative Meeting on Saturday and Sunday, July 23rd and 24th. They include visits to Folkestone, with a day trip, if desired, to Boulogne, and to Maidenhead, with a day trip, if desired, to Henley. The members of the Representative Meeting will dine together on Friday, July 22nd, at 7.45 p.m. for 8 p.m., at the Waldorf Hotel. If any Representative or member of the Council has not received the circular, he is requested to communicate with the Secretary of the Committee, Dr. E. Rowland Fothergill, at 429, Strand, W.C.

Motor Garage.

It has been arranged with the Alveston Motor Garage, whose premises open out of Roland Gardens, South Kensington, London, S.W., to provide garage accommodation for members bringing their cars from the provinces. The charge will be 2s. a day, to include standing in a lock-up garage and use of electric light and water. Members desirous of availing themselves of this accommodation should make early application to the Alveston Motor Garage.

National Temperance Breakfast.

The Annual Temperance Breakfast will be held on the morning of Thursday, July 28th, at 8 a.m., under the presidency of Mr. Pearce Gould (Vice-President, Royal College of Surgeons of England).

THE MEDICAL MUSEUM.

In accordance with custom, a medical museum has been organized in connexion with the Annual Meeting. The function of this museum is twofold.

In the first place, it serves the office of safeguarding and displaying those specimens which are required to illustrate papers in the Sections; and, in the second place, it is intended to depict advances in medicine and the allied sciences within recent years. The specimens shown by members of the various Sections will be arranged so as to be readily accessible to the visitor and form a special feature of the museum.

In order that the museum may discharge its second function, it has been divided into sections, and each section has been placed under an honorary curator.

Alimentary system	Dr. Hertz, of Guy's Hospital.
Anaesthetic section	Dr. Ada M. Browne, of the Chelsea Hospital for Women.
Bacteriology	Dr. Henderson Smith, of the Lister Institute.
Cardio-vascular system ...	Dr. T. Lewis, of City of London Hospital.
Cancer Research	Dr. Murray, of the Imperial Cancer Research Fund.
General Surgical Pathology	Dr. Braxton Hicks, of the Westminster Hospital.
Genito-urinary system ...	Dr. Swift Joly, of St. Peter's Hospital.
Gynaecology	Dr. Helen Chambers, of the Royal Free Hospital.
Laryngology	Dr. Harmer, of St. Bartholomew's Hospital.
Neurology	Dr. Wilson, the Queen Square Hospital.
Ophthalmology	Dr. Mayou, of the Paddington Green Children's Hospital.
Otology	Dr. Sydney Scott, of St. Bartholomew's Hospital.
Physiological and Pathological Chemistry	Dr. Ryffel, of Guy's Hospital.
Protozoology	Miss Muriel Robertson, of the London University.
Radiology	Dr. Ironside Bruce, of Charing Cross Hospital.
Respiratory System	Dr. Lakin, of Middlesex Hospital.
Tropical Medicine	Dr. Hutton, of the London School of Tropical Medicine.
Tuberculosis	Dr. Petrie, of the Lister Institute.

In most of the departments special attention has been given to the illustration of methods. In view of the increasing importance of protozoology to general medicine, it was thought that something approaching a complete series of parasitic protozoa might be exhibited with advantage to the practitioner. Many of these forms of life, it is true, are not at the present time found in man, but each series illustrates a type, and is of theoretic importance to-day, and may be of practical importance to-morrow. A number of life-cycles have been set up, and the visitor will be struck by the excellence of the specimens. Over 100 microscopical specimens are on view in the sections of protozoology and tropical medicine alone.

The museum, which is situated in the Elementary Physics Laboratory in the Imperial College of Science, will be open from 10 a.m. till 5 p.m. on each day, and notice of special demonstrations given by the honorary curators at convenient times will be posted at the doors. A catalogue has been compiled and will be distributed to visitors in the museum.

The Annual Exhibition.

The annual exhibition of surgical instruments, drugs, foods, books, and sanitary appliances will be held in the Great Hall and West Gallery of the Imperial Institute, the Jehanghier Hall being reserved for *x*-ray and high-frequency apparatus. The exhibition will be opened from 9 a.m. to 6 p.m. from Monday, July 25th, to Friday, July 29th, inclusive.

THE SECTIONS.

The following additional information has been received between June 25th and July 6th.

MEDICAL SOCIOLOGY.

President: JAMES ALEXANDER MACDONALD, M.D., Taunton.

Vice-Presidents: R. COCHRANE BUIST, M.D., Dundee; MAJOR GREENWOOD, M.D., London; HUGH R. KER, F.R.C.S.Edin., London; Professor JAMES T. J. MORRISON, M.B., Birmingham.

Honorary Secretaries: DONALD JOHN ARMOUR, F.R.C.S., 89, Harley Street, W.; HARVEY HILLIARD, M.R.C.S., 30, Wilton Place, Knightsbridge, S.W.; JAMES HENRY TAYLOR, M.B., 299, Eccles New Road, Salford.

The following is a provisional time table of the subjects selected for discussion. A syllabus is appended in each case.

Wednesday, July 27th, 10 a.m.

I.—THE ECONOMIC BASIS OF HOSPITAL MANAGEMENT.

1. *Provision of Funds:*—
Proportion of payments by—

i. Public grants:
Asylum boards,
Corporations,
Boards of guardians,
Education committees.
ii. Charitable or philanthropic:
Sunday funds,
Works collections,
Private subscribers and endowments.
iii. Payments by patients.

2. *Conditions of Admission:*—
In and out patients:

i. Free,
ii. Subscribers' letters,
iii. Partial payments,
iv. Recommendation by public bodies,
v. Almoners.

3. *Professional:*—
Staff:

i. Public subscriptions,
ii. Private subscriptions.

Principles of Resolutions adopted by the Association.

In the case of patients maintained from public funds, the medical service should be paid.

In the case of patients maintained from charitable funds, the medical service should be charitable.

In the case of patients paying for themselves, the medical service should be chosen by the patient and paid for by him.

4. *The Economic Basis of the Out-patient Department:*—

(*a*) Consultative.
(*b*) Dispensary:

i. From the professional point of view,
ii. From the patient's point of view,
iii. From the hospital point of view.

The discussion will be opened by Professor Benjamin Moore, followed by Sir Henry Burdett, K.C.B., Dr. Rentoul, Dr. Saundby, Mr. Hugh R. Ker, Dr. Mackintosh, Dr. Lauriston Shaw, and many others.

Professor BENJAMIN MOORE (Liverpool) will speak on the following points: (1) The fundamental notion that a hospital is an eleemosynary institution dependent upon charity is erroneous. The hospital ought to be regarded from the point of view of economics as an institution for the study and treatment of disease which cannot be adequately performed elsewhere, and hence as an institution for the benefit of the community or State, rather than primarily that of the individual. (2) The conception of a hospital as a voluntary charity produces the evil of two distinct types of hospital—namely, the Poor Law and the voluntary hospital, existing for two kinds of necessitous people, whereas there should be but one type of hospital. (3) As a result of the operation of No. (2), there arises the view in the lay mind that it is a disgrace to be attended in a Poor Law hospital, but that attendance in a voluntary hospital is no evidence of poverty, and even is a thing which can be claimed as a right by all. (4) An attempt should be made to place all hospitals on a common basis, and to insist that admission, except to accidents, should only be allowed upon a doctor's certificate that the case can be best treated in a hospital. (5) Persons possessing means admitted to a hospital, because their illness can best be treated there, should be compelled to pay, and the fees should be paid over to those giving them attention, or who have sent them in. (6) The view which regards the doctor in the hospital as a philanthropist should be discouraged, the present system of paying back consultants in kudos or by introductions to practitioners should be abandoned as a radical evil, and these physicians and surgeons should be properly paid for their work like any other body of public servants. (7) The system of voluntary hospitals is a failure, because of the facts (*a*) that these hospitals undertake a great deal of work which should not be done in hospital at all, (*b*) they leave undone a great deal of work which ought to be done, and (*c*), especially in their out-patient departments, they waste an inordinate amount of the time of workers in the community. The system of Poor Law hospitals is also a failure, first, because of the taint of the Poor Law system; secondly, because the attention to patients is inadequate, although the resident officers are sweated in their work, and a great deal of truly medical work is performed by nurses instead of by medical men who alone can perform such work properly; and, thirdly, because the hospitals are antiquated, insanitary, and overcrowded, so spreading disease from patient to patient and depreciating the health of the people. To replace this a properly organized, adequate, modern service of State hospitals is required, in which all cases shall be properly attended to by properly qualified and adequately paid medical officers. The reason for such a system is not charity or philanthropy, but purely and simply the economic demand for a healthy people, physically fit and capable of carrying on the work of the country; such a system will repay itself over and over again even from the monetary point of view, not to mention matters more important than money. (8) Since all medical service would be paid for under such a system, either by State or individual, the doctor does not suffer, he is able to carry out his work under better economic and social conditions, and the public have an infinitely better service. It is further obvious that hospital abuse is impossible, and many other evils, for the profession itself works the system and lay committees and charitable donors with their well-meant but unscientific interference have ceased to exist.

Friday, July 29th.

III.—SOCIAL ASPECTS OF THE FALLING BIRTH-RATE.

1. The facts: (*a*) Comparative national statistics; (*b*) comparative social statistics—that is, evidence as to the relative rates of decline in various social strata.
2. The factors: (*a*) spontaneous; (*b*) artificial.
3. The effects: (*a*) on selection, reproductive from more fertile classes natural, comparative class death-rates, infantile and juvenile; (*b*) on national efficiency, industrial, professional, and military; (*c*) on character, individual and national.

Problems for Discussion.

(*a*) Biological gain or loss in the process and its controllability.
(*b*) Methods of control, economic, ethical, medical.

The discussion will be opened by Dr. J. W. Ballantyne (Edinburgh), Dr. Fremantle, M.O.H. Herts, Dr. Gilchrist (Nice), and Dr. J. W. Hunter.

The following is a synopsis of Dr. J. W. Ballantyne's paper:

Tennyson's "torrent of babies" now reduced to a rivulet. The dangers of any attack upon the monogamic marriage shown in Rome under Augustus; the present-day dangers of an attack upon the constitution of the family as the sociological unit. Definition of the family. Some causes of the falling birth-rate; they cannot from their nature be easily counteracted; indication of the most hopeful lines of advance. The conservation of existing lives (antenatal and neonatal) and the prevention of the present wastage due to frequent abortion and stillbirth, neglect of maternal health in pregnancy, defective hygiene in the case of newborn infants, the divided duties of the working married woman, and the like. The ultimate restoration of the normal birth rate is not hopeless, but the tide is still flowing in the other direction. What shall be the immediate and future means of facing the existing situation?

Paper:

Gilchrist, Dr. A. W. (Nice). A Study in Eugenics or Genetics.

NAVY, ARMY, AND AMBULANCE.

President: Colonel Andrew Clark, A.M.S.(T.F.) London.

Vice-Presidents: Fleet Surgeon Percy W. Bassett-Smith, R.N., Haslar; Lieutenant-Colonel James Harper, R.A.M.C.T., London; Lieutenant-Colonel Michael W. H. Russell, R.A.M.C., London; Lieutenant-Colonel Robert J. S. Simpson, C.M.G., R.A.M.C., London.

Honorary Secretaries: Staff Surgeon James Garfit Wallis, M.B., R.N., Royal Naval Barracks, Chatham; Major Alfred Percy Blenkinsop, R.A.M.C., c.o. Messrs. Holt and Co., 3, Whitehall Place, S.W.; Major Arthur M. Connell, R.A.M.C.T., 79, Hanover Street, Sheffield.

The following programme has been arranged:

Wednesday, July 27th.—Papers:

Spencer, Major C. G., R.A.M.C. Local and Spinal Analgesia in Relation to Active Service.
Wildey, Fleet Surgeon, A. G., R.N. Hypodermic Injection in Action.
Wilson, Lieutenant-Colonel E. M., C.B., C.M.G., D.S.O., R.A.M.C. Medical Requirements in War for Assisting the Royal Army Medical Corps on Mobilization.

Thursday, July 28th.—Papers:

Pryn, Fleet Surgeon W. W., R.N. Colour Vision.
Collingwood, Fleet Surgeon G. T., R.N. Naval Recruits.
Lloyd, Captain Langford, D.S.O., R.A.M.C. Education and Intelligence from a Recruiting Point of View, with special regard to the Royal Army Medical Corps Regular and Territorial Service.
Giles, Colonel P. D., V.D. Training of Medical Units.

Friday, July 29th.—Papers:

Cummins, Major S. L., R.A.M.C. Isolation of Disease Carriers and Methods of Dealing with Them.
Cope, Surgeon L. F., R.N. Air and Ventilation in Modern Warships.
Clayton, Fleet Surgeon F. H. A. Tuberculosis in the Navy.

OTOLOGY

President: Edward Law, M.D., London.

Vice-Presidents: Albert Alexander Gray, M.D., Glasgow; Hunter F. Tod, M.D., London; Frederick H. Westmacott, F.R.C.S., Manchester.

Honorary Secretaries: Cecil Irving Graham, F.R.C.S., 47, Queen Anne Street, W.; Herbert James Marriage, F.R.C.S., 109, Harley Street, W.

The following subjects have been selected for special discussion:

Wednesday, July 27th.—Discussion on Aural Tuberculosis in Children. [The discussion will be limited to diagnosis, prognosis, and treatment, without details of operative procedure.] To be opened by Dr. W Milligan.

The following is an abstract of the opening paper:

Dr. Milligan will deal, in the first instance, with the frequency of aural tuberculosis in childhood, and will discuss in detail the usual routes of infection. The importance of recognizing the disease as of primary origin in the middle-ear cleft in a large proportion of the cases met with will be insisted upon. The main symptoms of aural tuberculosis—subjective and objective—will then be considered, and the various methods of establishing a definite diagnosis described and criticized. The complications most frequently met with will be enumerated and their relative importance dealt with. The important questions of prognosis and of treatment will be discussed and the results of treatment analysed. Suggestions will be made as to how to deal with cases of aural tuberculosis in school children, as to how to prevent dissemination of disease, and as to the advisability or otherwise of isolating infected children.

Thursday, July 28th.—Discussion on the Diagnosis and Treatment of Infective Labyrinthitis, to be opened by Docent Dr. Robert Bárány (Vienna), and Mr. C. E. West.

The following are abstracts of the opening papers:

(*a*) Dr. Bárány (Vienna) distinguishes the following forms of the disease: (1) Acute purulent labyrinthitis. (2) Latent purulent labyrinthitis. (3) Fistula of the labyrinth with intact membranous labyrinth (circumscript labyrinthitis). (4) Fistula of the labyrinth with slight lesion of the membranous labyrinth. (5) Fistula of the labyrinth with severe lesions of the membranous labyrinth. (6) Serous labyrinthitis. The differential diagnosis between these diseases is made possible by investigation of the condition of the semicircular canals, the methods of which were partly originated, partly worked out by the author. The most important sign of the diseases of the semicircular canals is the spontaneous vestibular nystagmus, which may be present either continuously (acute labyrinthitis), or only during attacks (circumscript labyrinthitis). The investigation into the function of the semicircular canals consists in the experimental irritation of the canals by means of (1) turning, (2) rapid head movements, (3) syringing with cold and hot water, (4) galvanization, (5) compression and aspiration of the air in the meatus. All these different irritations produce quite definite forms of vestibular nystagmus, which must be observed carefully. Also intracranial diseases produce vestibular nystagmus, especially those of the posterior fossa (cerebellar abscess, meningitis). The author gives the differential diagnosis between the diseases of the labyrinth and the intracranial complications which often accompany the labyrinth trouble. This diagnosis is built upon the observation of the spontaneous nystagmus and the exact examination of the irritability of the semicircular canals.

(*b*) C. Ernest West: Infections of the labyrinth may be either pyogenic or non-pyogenic; the former constitute the main subject of the paper. Pyogenic infection may be either diffuse or localized to a portion of the labyrinth; this part may be restricted to the labyrinthine wall. Diffuse infection may be either acute or chronic; localized infection is always chronic. Necrosis of the labyrinthine capsule may take place in either acute or chronic conditions. The dangers and incapacities caused by infective labyrinthitis. Treatment of infective labyrinthitis chiefly operative by the necessity of the case. The aims of operative treatment. The treatment of chronic local infections by the radical mastoid operation and curettage. The operative treatment of the diffuse infections, whether acute or chronic, by drainage of the labyrinth. The vestibulotomies, inferior and double—technique and after-treatment. Tuberculous labyrinthitis. Necrosis of the labyrinthine capsule. Non-pyogenic infections of the labyrinth, syphilis, mumps. Non-suppurative labyrinthitis in otitis media.

After the discussion a demonstration with the Epidiascope of specimens illustrating diseases of the labyrinth will be given by Professor A. Politzer of Vienna.

Friday, July 29th.—Papers:

Horne, Dr. Jobson. Deafness and Diseases of the Ear in relation to the Public Services and Insurance; and their Bearing upon Forensic Cases and the Choice of a Means of Earning a Livelihood.

YEARSLEY, Mr. Macleod. The Value of Ossiculectomy in Chronic Middle-Ear Suppuration.

HOVELL, Mr. Mark. Some Remarks on the Connexion between Affections of the Mucous Membranes throughout the Body and Middle-Ear Disease.

BARR, Dr. J. Stoddart. Experiments bearing upon the Practicability of Treating Meningitis (septic and specific) by Means of Lavage of the Cerebro-Spinal Subarachnoid Spaces; preliminary communication.

Members are invited to contribute any preparations, specimens, or drawings, or any instruments or apparatus pertaining to the work of the Section, which have been designed by themselves, in order that the Committee of the Section may make arrangements to form a special exhibit of such objects.

PHYSIOLOGY.

President: **Professor WILLIAM H. THOMPSON, M.D., Dublin.**

Vice-Presidents: **JOHN SCOTT HALDANE, M.D., F.R.S., Oxford; Professor PERCY THEODORE HERRING, M.D., St. Andrews, N.B.**

Honorary Secretaries: **T. GRAHAM BROWN, M.B., Physiological Department, University, Glasgow; J. STRICKLAND GOODALL, M.B., Physiological Laboratory, Middlesex Hospital, W.**

The following programme has up to now been arranged:

Wednesday, July 27th.—Opening remarks by the President, Professor W. H. Thompson. Discussion on the Food Requirements of Man for Sustenance and Work. To be opened by Lieutenant-Colonel Melville, R.A.M.C.; followed by Professor J. G. Hopkins, Professor Haldane, Dr. M. S. Pembrey, Dr. Robert Hutchison, Dr. Chalmers Watson, and others.

The following is a synopsis of Lieutenant-Colonel MELVILLE'S paper:

Discussion of a concrete case. Subject of experiment, 20 infantry soldiers, taken at random. Average weight, 64 kg. Duration of experiment, 12 days. Average amount of work done, internal and external, 4 034 calories per diem. Internal work placed at 3,000 calories. Reasons for this estimate given. Food supplied:—First six days: Proteids, 190 grams; carbohydrates, 510 grams; fat, 58 grams. Second six days: Proteids, 145 grams; carbohydrates, 450 grams; fat, 110 grams. Average: Proteids, 168 grams; carbohydrates, 480 grams; fat, 84 grams. Energy value: First six days, 3 426 calories; second six days, 3 503 calories; average, 3,481 calories, or net 3,140 calories (10 per cent. deducted); deficit, about 890 calories. Effect on weight and condition: General rise in early part of experiment, followed by steady fall during latter part. Discussion of primary rise in weight: Attributed to retention of proteid, the result of stimulus to muscular activity given by marching, *plus* increase in amount of proteid and carbohydrate ingested in comparison with barrack rations. Discussion of secondary fall: Daily loss of weight during second period roughly about equal to estimated deficit of energy supplied in food during that period. Illustration from starvation experiment by Benedict. Discussion of amount of proteid ingested: Reasons for believing that allowance in second week not at all too high. Difficulty in giving proteid ration on active service. Variety more important than actual quantity. Discussion of carbohydrates: Limitations as regards amount of starchy food that can be eaten by certain classes. Discussion of fats: Craving for fat felt in second week of experiment, even on allowance of 110 grams. Suggestion for discussion: Given a demand for 5,000 calories of energy, of which 2,600 are given in the form of beef and biscuit (the conditions of first six days), in what proportions should fats and sugars be given to supply the deficit of 1,400 calories?

PSYCHOLOGICAL MEDICINE AND NEUROLOGY.

President: **THEO. BULKELEY HYSLOP, M.D., F.R.S.E., London.**

Vice-Presidents: **ARCHIBALD R. DOUGLAS, L.R.C.P., Lancaster; WILLIAM GRAHAM, M.D., Belfast; THOMAS D. GREENLEES, M.D., London; J. RISIEN RUSSELL, M.D., London; DAVID G. THOMSON, M.D., Norwich.**

Honorary Secretaries: **ARTHUR STANLEY BARNES, M.D., 141, Great Charles Street, Birmingham; ROBERT HUNTER STEEN, M.D., City of London Mental Hospital, Dartford; REGINALD JOHN STILWELL, M.R.C.S., Moorcroft, Hillingdon, Uxbridge.**

Thursday, July 28th.—Discussion on the Treatment of Tabes. To be opened by J. Risien Russell, M.D., London. The following will take part in the discussion: Drs. David Ferrier, Byrom Bramwell, Ernst Feibes, Alexander Bruce, Lieven, Judson Bury, J. Michell Clarke, and G. Farquhar Buzzard.

The following is a synopsis of Dr. RISIEN RUSSELL'S opening statement:

The only rational treatment of the disease is that based on a correct conception of its etiology and pathology. The evidence in support of the belief that the disease owes its origin to syphilis far outweighs that which can be adduced in favour of any other view of its etiology. It is impossible to overestimate the importance of antisyphilitic treatment of the affection. It is contrary to fact that the subjects of tabes are made worse by antisyphilitic treatment. Mercury is the drug on which most reliance is to be placed. The plan of exhibiting the drug by inunction, which is in vogue at Aachen (Aix-la-Chapelle) either alone or in conjunction with intramuscular injections, is that to be recommended. Difficulties of securing efficient conduct of the treatment in this country. No reliance should be placed on the administration of mercury by the mouth. Adjuncts in the treatment. Precautions that are necessary while it is in vogue. Contraindications to the treatment. A long interval between the primary syphilis and the occurrence of tabes is no necessary bar to the possibility of good resulting from the treatment. Statistics that appear to prove that the more the primary syphilis is treated by mercury the shorter the interval before tabes develops, should not be allowed to deprive the patient of the only rational method there is of treating his disease. The fact that the primary syphilis has been well treated is no adequate reason why antisyphilitic treatment should be withheld from the patient suffering from tabes.

CENTRAL MIDWIVES BOARD.

A MEETING of the Central Midwives Board was held at Caxton House, Westminster, on June 30th, with Sir FRANCIS CHAMPNEYS, Bart., in the chair.

Honour to Chairman.

The following resolution was unanimously passed:

That the hearty congratulations of this Board be accorded to its Chairman on the distinguished honour conferred on him by the King, an honour they feel he so well deserved for the dignity, courtesy, and impartiality with which he has presided over the Board's deliberations since its commencement.

Suspension of Midwives.

A letter was considered from Miss F. M. Bernard-Boyce, Inspector of Midwives for the County of Norfolk, stating that the period of suspension for the purpose of disinfection in that county had been reduced to seven days. The Board passed the following resolution:

The Board considers that it is unfortunate that the arrangements for disinfection in the County of Norfolk are so far from adequate, and hopes that they will be provided without delay.

A second letter was considered from Miss F. M. Bernard-Boyce, inquiring whether the local supervising authority has power to suspend a midwife, for the purpose of preventing the spread of infection, on the ground that she has been in attendance on a case of puerperal fever as a maternity nurse, and not as a midwife.

The Board decided to reply that the local supervising authority has power to suspend a midwife under the circumstances mentioned.

Retirement of Midwives.

A third letter was considered from Miss F. M. Bernard-Boyce suggesting that women whose names had been removed from the roll on their own application should be entitled to receive from the Board a document vouching that they had been duly certified by the Board, and that being desirous of retiring from practice they had voluntarily resigned their certificate.

The Board decided that in the case of certificates voluntarily surrendered the cancellation should be effected by writing across the face of the certificate the words, "Cancelled at her own request." The certificate may then be returned to the holder.

Provision of Midwives by the State.

A letter was considered from the Right Hon. G. W. Palmer, of Newbury, as to the difficulty of maintaining midwives in country districts by voluntary efforts, and the necessity of their provision by the State.

The Board instructed the Secretary to reply that the Board had considered the question at the instance of the President of the Local Government Board, and thought that it was desirable that the State should subsidize midwives for poor and sparsely populated districts unreached by existing institutions.

Midwives and Pupils.

A letter was considered from the British Medical Association as to the danger of midwives employing their pupils as substitutes, and suggesting that a midwife should be made directly responsible for any misconduct on the part of her pupil.

The Board decided that the British Medical Association be informed that a midwife employing a pupil is already responsible to the Central Midwives Board for any breach of the rules by her pupil.

Complaint Against a Midwife.

A letter was considered from Dr. J. Lloyd Davies of Newport, Mon., complaining of the conduct of a certified midwife.

The Board decided that Dr. J. Lloyd Davies be informed (1) That as regards the complaint, it did not appear to come under the jurisdiction of the Board. (2) That as regards the alleged breach of the Board's rules on the part of the midwife, the proper quarter to which complaint should be made in the first instance was the local supervising authority. If that body found a prima facie case within the meaning of Section 8 (2) of the Midwives Act to be established against the midwife, the Board would then proceed to deal with the matter.

Practice of Midwifery by Unqualified Men.

A letter was considered from Sir Donald MacAlister, President of the General Medical Council, as to the practice of midwifery by unqualified men.

The Board decided that a copy of the Board's resolution of May 26th, 1910, dealing with the practice of midwifery by unqualified men, be forwarded to the President of the General Medical Council. [The resolution was to the effect that the Board should make representations to the Privy Council as to the desirability of amending the law so as to prevent the practice of midwifery by unqualified men.]

Amendment of Midwives Bill.

A letter was considered from the Clerk of the Worcestershire County Council, suggesting an amendment of Clause 17 of the Midwives Bill, 1910, and the Board suggested that the Worcestershire County Council should communicate direct with the Privy Council.

Exemption from Supervision.

Correspondence which had passed between the Secretary and the Monmouthshire Training Centre for Midwives as to an application by that body for the grant of exemption from supervision by the local supervising authority was considered.

The Board directed the Secretary to reply, pointing out that the Board has no power to grant exemption from supervision further than that which is automatically conferred by Rules E, 24 and 25.

CORONERS' LAW AND DEATH CERTIFICATION (AMENDMENT) BILL.

THIS bill was presented on April 27th by Sir William Collins, supported by Colonel Lockwood, Sir Philip Magnus, Sir Luke White, Dr. Hillier, Dr. Chapple, and Mr. O'Grady.

MEMORANDUM.

This bill, which does not apply to Scotland or Ireland, is intended to remove certain anomalies in the law relating to coroners and inquests, and to the certification of deaths, disclosed by reports of several committees during recent years.

The Coroners Act, 1887, did little more than codify the principal features of the law and practice of coroners, which had become confused and complicated by numerous statutes dating from the reign of Edward I. In 1893 a Select Committee was appointed to "inquire into the sufficiency of the existing law as to the disposal of the dead, for securing an accurate record of the causes of death in all cases, and especially for detecting them where death may have been due to poison, violence, or criminal neglect." The report of that committee indicated the urgent necessity for reform. The Inter-Departmental Committee on Physical Deterioration which sat in 1903 also directed attention in their report to the dangers incidental to the defects in the law relative to the registration and certification of deaths and recommended the registration of stillbirths.

The law relating to coroners is not adapted to modern necessities, its administration is costly to local authorities without securing efficiency in results.

In December, 1908, a Departmental Committee of the Home Office was appointed to inquire into the law relating to coroners and coroners' inquests, and into the practice in coroners' courts.

The provisions of this bill are intended to give effect to many of the recommendations of the Departmental Committee of 1908 and of the Death Certification Committee of 1893.

The report of the Departmental Committee drew attention to anomalies existing in the appointment of coroners in certain "franchise districts," in the qualifications required of coroners, the conditions of their appointment, the mode of their remuneration, the provision of deputies, the areas of jurisdiction, etc.

The law does not at present contemplate inquiry by a coroner except in view of a subsequent formal inquest, nor can he order a *post-mortem* examination except in a case of inquest. The coroner's officer, to whom important duties are confided, is an official unknown to the law. The viewing of the body by the jury is still compulsory though no longer deemed necessary in all cases. Attention was also directed by the committee of 1908 to the need for better provision in regard to skilled medical investigators and to the remuneration of medical witnesses.

The Departmental Committee recall the findings of the Select Committee on Death Certification of 1893, which have not hitherto been the subject of legislation, as bearing directly on the functions of the coroner. Thus at present the law does not require a certificate of death to certify as to the fact of death or the identity of the deceased, but merely the cause of death. They further state that "it is no fault of the law if premature burials do not take place. The present law of death certification offers every opportunity for premature burial and every facility for concealment of crime."

ARRANGEMENT OF CLAUSES.

PART I.

CORONERS.

Clause.

1. Appointment of coroners. Coroners' districts.
2. Payment of coroners.
3. Retirement of coroners.
4. Superannuation of coroners.
5. Qualifications of coroners.
6. Deputy coroners.
7. Coroners' courts, etc.
8. Service of summonses, etc.
9. Inquiry without inquest.

Clause.
10. Medical investigators.
11 Medical witnesses' fees.
12. View of body at inquest.
13. Records.
14. Rules for guidance of coroners.
15. Definition of "coroner."

PART II.
REGISTRATION AND CERTIFICATION OF DEATH AND BURIAL.
16. Production of certificate of death.
17. Inspection and identity of dead body.
18. Form of death certificate.
19. Filing of certificate of death.
20. Notification of death.
21. Penalties.
22. Inspection of certificates of death by coroners.
23. Certificates of burial.
24. Retention of unburied bodies.
25. Definition of "certificate of death."

PART III.
MISCELLANEOUS.
26. Definition of "dead body" and "person."
27. Construction, citation, and repeal.
SCHEDULES.

A BILL to amend the law relating to coroners' law and the certification and registration of deaths and burial.

Be it enacted by the King's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

PART I.
CORONERS.

1. *Appointment of Coroners.*—(1) Except as provided by section twenty-nine of the Coroners Act, 1887, section one hundred and seventy-one of the Municipal Corporations Act, 1882, or section five or section thirty-four of the Local Government Act, 1888, every power to appoint a coroner shall cease upon the first occurrence of a vacancy in the office of coroner after the *commencement of this Act.*

(2) Upon the occurrence of a vacancy as aforesaid the district in respect of which the vacancy occurs shall cease to be a separate coroner's district:

Coroners' Districts.—Provided that where such district or any part of such district is included within the district of a borough coroner, it shall, upon the occurrence of such vacancy as aforesaid, be deemed to form part of such borough coroner's district, and where such district or any part of such district is included within any area under the jurisdiction of a council whose duty it is to appoint a coroner or coroners under the Local Government Act, 1888, such district or any part of such district shall be deemed to be included within the area in respect of which such council must appoint a coroner or coroners, and the council may assign such district or part of such district to one of the existing county coroners, or may present a petition to His Majesty for the rearrangement of the county into districts in the manner provided for in the Coroners Act, 1844.

(3) Where the district and duties of a coroner are increased in consequence of this section, it shall be the duty of the county or borough council, as the case may be, to reconsider the question of the salary assigned to such coroner.

(4) The district of every franchise coroner may cease to be a separate coroner's district at any earlier date than that of avoidance of office of coroner by agreement between the county or borough council and the person or persons who at present exercise the right of appointment to the franchise.

2. *Payment of Coroners.*—There shall be paid to every coroner such salary as the authority by whom he is appointed and paid may decide, provided that after the lapse of five years from the date of appointment of the coroner, and of every successive period of five years, it shall be lawful for the authority to revise and thereby increase or diminish such salary, and if the coroner is dissatisfied with such revision the Secretary of State may determine the amount of such salary on the application of either the authority or the coroner.

3. *Retirement of Coroners.*—Every coroner shall cease to continue to hold the office of coroner on reaching the age of sixty-five years, provided that the Secretary of State may continue such coroner in office for a further period not exceeding five years on the application of either the authority by whom he was appointed or the coroner.

4. *Superannuation of Coroners.*—Any local authority who appointed a coroner may grant to him, if he is a whole-time officer, and if by reason of compulsory retirement or from infirmity he becomes incapable of executing the duties of his office, an annuity by way of superannuation allowance for such an amount, and under such regulations, as may be prescribed by the Secretary of State, and such allowance shall be defrayed out of the fund from which the salary or fees of such coroner would have been paid if he had continued in office.

5. *Qualifications of Coroners.*—No person shall be appointed a coroner unless he be a practising barrister of not less than five years' standing, or a solicitor of not less than five years' standing, or a registered medical practitioner who is also a barrister or a graduate in law of a university in the United Kingdom, provided that no member of the authority making the appointment, nor any person who has been a member of such authority within a period of twelve months immediately before the making of the appointment, shall be eligible for appointment as a coroner by such authority.

6. *Deputy Coroners.*—Within six months after *the passing of this Act* every county and borough council shall appoint a deputy coroner to the coroner in each district of the county or borough, and shall further appoint a second deputy to each such district or borough to act in times of emergency when the first deputy coroner is unable to perform the duties of coroner. Every such deputy coroner, when acting as coroner, shall be paid such remuneration out of the fund from which the coroner is paid as the Secretary of State may approve.

7. *Coroners' Courts, etc.*—Every coroner's district shall be provided by the authority who appoints the coroner with suitable accommodation for holding inquests, and with a coroner's officer or officers and other assistance as may be necessary for the proper carrying out of the duties of the office of coroner.

8. *Service of Summonses, etc.*—Every summons, warrant, notice, or other document issued by a coroner, and requiring personal service, shall be served only by the coroner's officer, who shall be duly sworn in as a constable before a justice of the peace for the district in respect of which he is acting.

9. *Inquiry Without Inquest.*—(1) Notwithstanding anything in subsection (1) of section three of the Coroners Act, 1887, a coroner after due inquiry into any case referred to him may decide not to hold an inquest if he is satisfied that the deceased died a natural death.

(2) For the purposes of an inquiry under this section, the coroner may order a *post-mortem* examination, and the cost of such examination, being such sum as the Secretary of State may by regulation prescribe, shall be defrayed as if the examination were made in connexion with an inquest.

10. *Medical Investigators.*—Any county or borough council may appoint one or more medical investigators or pathologists in each coroner's district to assist the coroner in his inquiries and inquests and to make *post mortem* examinations. Such medical investigators or pathologists shall be paid such remuneration out of the county or borough rate as the county or borough council may determine.

11. *Medical Witness's Fees.*—(1) Where a medical witness is not a medical investigator or pathologist appointed by the county or borough council he shall be entitled to receive such remuneration as the Secretary of State shall by regulation prescribe.

(2) Section twenty-two of the Coroners Act, 1887, shall be repealed as from the date when a regulation made under this section shall come into operation.

12. *View of Body at Inquest.*—(1) Notwithstanding the provisions of subsection (1) of section four of the Coroners Act, 1887, it shall not be necessary for the

jury at any inquest to view the body unless the coroner or, at any time during the first sitting of the inquest, a majority of the jury shall deem a view necessary.

(2) Subsection (6) of section eighteen of the Coroners Act, 1887, shall be construed as if the words "the first sitting of the inquest" were substituted for the words "view of the body."

13. *Records.*—Every coroner shall cause a record of every inquiry and inquest to be kept, and shall transmit such record to the clerk of the council or borough council, as the case may be, and it shall become the property of such county council or borough council, as the case may be, and such record shall be so made and transmitted as the Secretary of State may by regulation prescribe.

14. *Rules for Guidance of Coroner.*—The Secretary of State may frame rules and orders for regulating the procedure or practice of coroners' inquiries and coroners' courts and forms of proceedings therein, the fees to be charged for copies of depositions, records, or any document in the custody of the coroner or the local authority, and any other matter not regulated by statute on which it may, in the opinion of the Secretary of State, be desirable to prescribe the practice of coroners, and may from time to time amend such rules, orders, forms, and fees.

15. *Definition of "Coroner."*—In this part of this Act, except for the purposes of section four, the expression "coroner" shall include deputy coroner.

PART II.

REGISTRATION AND CERTIFICATION OF DEATH AND BURIAL.

16. *Production of Certificate of Death.*—No death shall be registered under the Registration Acts without the delivery to the registrar of a certificate of death duly signed by a registered medical practitioner, or by a coroner, after holding an inquiry or inquest.

17. *Inspection and Identity of Dead Body.*—Before giving a certificate of death, a registered medical practitioner shall personally inspect the body and identify it as the body of the person named in the certificate whom he has attended during his last illness, and shall certify to the fact of death as well as to its cause.

18. *Form of Death Certificate.*—(1) Every certificate of death shall be in the form set forth in the First Schedule to this Act or in such other form as shall from time to time be prescribed for the purpose by the Registrar-General of Births, Deaths, and Marriages, after publication of his intention to prescribe such form in the *London Gazette* with the proposed form annexed, provided that any such other form of certificate shall include the particulars set forth in the said schedule.

(2) The Registrar-General shall gratuitously supply forms of certificate to any registered medical practitioner who applies for the same.

19. *Filing of Certificate of Death.* — (1) Every registered medical practitioner who shall give a certificate of death shall, within twenty-four hours after such death takes place, send such certificate to the registrar of deaths for the district in which the death took place.

(2) Certificates of death sent by post to the registrar of deaths under this section shall be exempt from postage.

20. *Notification of Death.*—(1) When the registered medical practitioner who attended a person during his last illness is unable to give a certificate of death, he shall forthwith notify to the coroner the fact of such death with the reasons for his inability to give such certificate.

(2) When no registered medical practitioner has attended the deceased person during his last illness, the relatives, friends, or other persons having cognizance of the death, or of any doubtful or suspicious circumstances attending the death, shall themselves report full particulars thereof to the coroner.

21. *Penalties.*—Every registered medical practitioner who fails to comply with any of the provisions of this part of this Act shall for every such offence be liable, on summary conviction, to a penalty not exceeding *forty shillings.*

22. *Inspection of Certificates of Death by Coroners.*—The Registrar-General of Deaths shall make arrangements whereby each district registrar shall afford facilities to the coroner for the inspection by such coroner or his officer of the certificates of death of any persons who have died within the district of the said coroner, or whose body may have been brought within his jurisdiction.

23. *Certificates of Burial.*—Every person who shall bury or otherwise dispose of any dead body shall certify, by endorsement of the burial order (which endorsement shall be in the form set forth in the Second Schedule to this Act), the name of the place, the date, and the mode of burial, or other mode of disposal of the dead body, and shall send such order to the registrar of deaths in whose district the death was registered within five days after such burial or other disposal of the dead body. Such certificate shall, together with the certificate of death, or finding of the coroner after inquiry, or verdict after inquest, as the case may be, be entered in a book kept for the purpose, to be called the "register of deaths and burials."

Any person who fails to comply with the provisions of this section shall, on summary conviction, be liable to a fine not exceeding *fifty pounds* for every day during which he fails to comply as aforesaid.

24. *Retention of Unburied Bodies.*—No person responsible for the burial or other disposition of any dead body shall retain the same, or delay the burial or other disposition of the same for any longer period than eight days after death, except with the previous written consent of a justice of the peace. Before giving this consent such justice shall be satisfied that such retention or delay is reasonable, and the consent shall state the period and grounds of such retention or delay. Any person who fails to comply with the provisions of this section shall, on summary conviction, be liable to a fine not exceeding *five pounds* for every day during which he fails to comply as aforesaid.

25. *Definition of "Certificate of Death."*—For the purposes of this part of this Act a certificate of death shall be deemed to be a certificate of the cause of death within the meaning of the Registration Acts.

PART III.

MISCELLANEOUS

26. *Definition of "Dead Body" and "Person."*—Any dead child which has issued forth from its mother after the expiration of the twenty eighth week of pregnancy, whether alive or dead, shall be the dead body of a person within the meaning of the Coroners Act, 1887, and this Act, and a person within the meaning of the Births and Deaths Registration Act, 1874.

27. *Construction, Citation, and Repeal.*—(1) Part I of this Act shall be construed as one with the Coroners Acts, 1887 and 1892.

(2) Part II of this Act shall be construed as one with the Registration Acts.

(3) This Act may be cited as the Coroners and Death Certification Act, 1910.

(4) This Act shall not apply to Scotland or Ireland.

(5) The enactments mentioned in the Third Schedule to this Act are hereby repealed to the extent specified in the third column of that schedule.

SCHEDULES.

FIRST SCHEDULE.

CERTIFICATE OF DEATH.

I hereby certify that I attended ..... during his (her) last illness; that such person's age was stated to be ..... ; that I last saw him (her) alive on the ..... day of ..... 19..... ; that he (she) was stated to have died on the ..... day of ..... 19..... at ..... o'clock in the .....noon, and that I examined the body on .....day at ..... o'clock in the ..... noon and hereby certify to the fact of death of such person, and that to the best

of my knowledge and belief the cause of death was as hereunder written, and that the particulars given in reply to the questions are correct.

CAUSE OF DEATH.

Primary .....
Secondary .....
.....

Was the cause of the death ascertained or confirmed by an autopsy?.....

Was any surgical operation performed upon the deceased person during life and within one month previous to death, and if so what was the nature of the operation?.....

Have you any reason to think that any accident, neglect, poison, violence, or any other than natural causes contributed to the death?.....

Witness my hand this.....day of.....19.....
Signature.....
Qualification as registered by Medical Council.....
Residence.....

SECOND SCHEDULE.

ENDORSEMENT OF BURIAL ORDER.

Name of burial ground .....
No. of grave .....
Parish.....
Date of burial .....
Whether earth burial, vault, or cremation.....

THIRD SCHEDULE.

ENACTMENTS REPEALED.

Session and Chapter.	Short Title.	Extent of Repeal.
23 & 24 Vict. c. 116	The Coroners Act, 1360	The whole Act.
37 & 38 Vict. c. 88	The Births and Deaths Registration Act, 1874	Subsection (2) of section twenty, and in the same section the words "if any person" to the end of the section.
50 & 51 Vict. c. 71	The Coroners Act, 1887	Sections twelve, subsections (1), (2), (3), and (4) of section eighteen, and the words "in payment of a reasonable sum for the same, not exceeding the rate of three halfpence for every folio of ninety words," in subsection (5) of that section, and thirty-three.
55 & 56 Vict. c. 56	The Coroners Act, 1892	Subsections (1), (2), and (3) of section one.

Vital Statistics.

HEALTH OF ENGLISH TOWNS.

In seventy-seven of the largest English towns 8,350 births and 3,588 deaths were registered during the week ending Saturday last, July 2nd. The annual rate of mortality in these towns, which had been 11.4, 11 1, and 11.2 per 1,000 in the three preceding weeks, declined to 11 0 per 1,000 last week. The rates in the several towns ranged from 3 7 in East Ham, 6.3 in Willesden and in Hornsey, and 6.4 in Derby, to 16.2 in St. Helens, 17.1 in Huddersfield, 18 1 in Oldham, 19 2 in Warrington, and 21 3 in Tynemouth. The death-rate from the principal infectious diseases averaged 1 0 per 1,000; in London the rate did not exceed 0 8 per 1,000, while among the seventy-six other large towns it ranged upwards to 2 8 in Grimsby and in Warrington, 2.9 in Oldham, 3.0 in Stockport, and 3.3 in Barrow-in-Furness. Measles caused a death-rate of 1 2 in Liverpool, 1.7 in Preston, 1 8 in Oldham, 2.0 in Merthyr Tydfil, and 3.3 in Barrow-in-Furness; whooping-cough of 1.1 in Manchester, 1.4 in Ipswich, 1.5 in Stockport and in Bootle, and 2 1 in Warrington; and diarrhoea of 2 1 in Grimsby. The mortality from scarlet fever, from diphtheria, or from enteric fever, showed no marked excess in any of the large towns, and no fatal case of small-pox was registered during the week. The number of scarlet fever cases under treatment in the Metropolitan Asylums Hospitals and in the London Fever Hospital, which had been 1,401, 1,353, and 1,353, at the end of the three preceding weeks, rose to 1,378 at the end of the week under notice; 183 new cases were admitted during the week, against 181, 166, and 187, in the three preceding weeks.

HEALTH OF SCOTTISH TOWNS.

DURING the week ending Saturday last, July 2nd, 936 births and 477 deaths were registered in eight of the principal Scottish towns. The annual rate of mortality in these towns, which had been 14.2, 13.9, and 13.3 per 1,000 in the three preceding weeks, further declined to 13.2 last week, and was 2.2 per 1,000 above the mean rate during the same period in the seventy-seven large English towns. Among these Scottish towns the death-rates ranged from 10.1 in Aberdeen and 11 7 in Edinburgh to 14.4 in Leith and 22.1 in Dundee. The death-rate from the principal infectious diseases averaged 1.3 per 1,000, the highest rates being recorded in Paisley and in Dundee. The 215 deaths from all causes recorded in Glasgow included 1 which was referred to measles, 2 to scarlet fever. 2 to diphtheria, 5 to whooping-cough, and 10 to diarrhoea. Five deaths from measles and 4 from whooping-cough were registered in Dundee.

HEALTH OF IRISH TOWNS.

DURING the week ending Saturday, July 2nd, 665 births and 355 deaths were registered in the twenty-two principal urban districts of Ireland, as against 539 births and 396 deaths in the preceding period. The annual death-rate in these districts, which had been 17.8, 18.9, and 17.9 per 1,000 in the three preceding weeks, fell to 16.1 per 1,000 in the week under notice, this figure being 5 1 per 1,000 higher than the mean annual death-rate in the seventy-seven English towns for the corresponding period. The figures in Dublin and Belfast were 15 3 and 18.3 respectively, those in other districts ranging from 4.0 in Dundalk and 4.4 in Lurgan, to 27 2 in Galway and 33 6 in Sligo, while Cork stood at 17.8. Londonderry at 7.2, Limerick at 20 5, and Waterford 15.6. The zymotic death-rate in the twenty-two districts averaged 1.8 per 1,000, as against 2 3 per 1,000 in the preceding period.

Naval and Military Appointments.

ROYAL NAVY MEDICAL SERVICE.

THE following appointments have been made at the Admiralty: Fleet Surgeon H. X BROWNE to the *Andromeda*, on its becoming the parent ship, June 18th; Fleet Surgeon A. G. WILDEY, to the *President*, additional, for three months' course at Dreadnought Hospital, Greenwich, July 2nd; Fleet Surgeon A. MACLEAN, M.B., to the *Jupiter*, July 2nd; Staff Surgeon J. K. RAYMOND, M.B., to the *Hearty*, temporarily, June 18th; Staff Surgeon W. R. CENTER, M.B., to the *Collingwood*, temporarily, June 28th; Staff Surgeon J. S. DUDDING, to the *Ganges*, for the *Ganges II*, June 28th; Surgeon F. COCK, to the *Latona*, June 18th; Surgeon C. R. M. BAKER, M.B., to the *Antelope*, on commissioning, June 25th; Surgeon W. MEARNS, M.B., to the *Redbreast*, July 2nd; Surgeon J. McA. HOLMES, M.B., to the *Actaeon*, July 2nd; Fleet Surgeon J. C. FERGUSON, M.B., to the *Crescent*, July 2nd; Fleet Surgeon H. CLIFT to the *Venerable*, July 2nd; Fleet Surgeon C. S. FACEY, M.B., to the *President*, additional, for temporary service at the Admiralty Recruiting Department, July 14th; Staff Surgeon L. S. WHITWAM, M.B., and C. A. G. PHIPPS to the *Pembroke*, additional, for disposal, July 2nd; Surgeon A. B. MARSH to the *Vivid*, additional, for disposal, July 2nd; Staff Surgeon S. CRONEEN to the *Bulwark*, temporarily, for the manœuvres, July 1; Surgeon T. A. SMYTH, M.B., to the *Victory*, additional, for the *Rainbow*, July 11th.

ARMY MEDICAL SERVICE.

ROYAL ARMY MEDICAL CORPS.

LIEUTENANT-COLONEL J. M. F. SHINE, M.D., serving in India as Senior Medical Officer, Naini Tal, assumed temporary charge of the office of Principal Medical Officer, 8th (Lucknow) Division, from May 8th.

Lieutenant-Colonel A. A. SUTTON, D.S.O., has been appointed Senior Medical Officer, Sierra Leone, vice Major F. J. W. Porter, D.S.O.

Major T. W. GIBBARD, M.B., has been appointed Lecturer in Syphilology at the Royal Army Medical College, vice Colonel F. J. Lambkin.

Lieutenant HAROLD BEVIS resigns his commission, June 22nd. His appointment bore date August 1st, 1908.

INDIAN MEDICAL SERVICE.

LIEUTENANT-COLONEL G. W. P. D. DENNYS, Administrative Medical Officer, North-West Frontier Province, has been selected for appointment as Principal Medical Officer, Aden Brigade. Lieutenant-Colonel A. L. DUKE succeeds him at the North-West Frontier Province.

The undermentioned officers are appointed Specialists as noted: Ophthalmology—Captain W. H. HAMILTON, 2nd (Rawal Pindi) Division, April 6th; Captain P. S. MILLS, M.B., 5th (Mhow) Division, April 4th. Electrical Science—Lieutenant J. A. SHORTEN, M.B., 2nd (Rawal Pindi) Division, April 7th. Otology, Laryngology, and Rhinology—Lieutenant R. E. WRIGHT, M.B., Burma Division, May 1st. Midwifery and Diseases of Women and Children—Major G. TATE, M.B., 2nd (Rawal Pindi) Division, May 1st.

Lieutenant-Colonel P. D. PANK, Bengal, has retired from the service, from May 17th. He was appointed Surgeon, March 31st, 1880, and Lieutenant-Colonel, March 31st, 1900. He served with the Mahsud Waziri Expedition in 1881.

Lieutenant-Colonel W. S. P. RICKETTS, M.B., also retires from the service, from June 10th. He joined the Bombay Medical Department as a Surgeon-Captain, March 30th, 1889, and became Lieutenant-Colonel, March 30th, 1909. He took part in the operations in Somaliland in 1902–3, receiving a medal with clasp.

The retirement of Lieutenant-Colonel D. S. E. BAIN, which has been already noted in the BRITISH MEDICAL JOURNAL, has received the approval of the King.

The promotion of Captain R. F. BAIRD to be Major is antedated from January 28th, 1910, to July 28th, 1909.

The retirement from the service of Lieutenant-Colonel R. JAMES, M.B., Madras, which has been already announced in the BRITISH MEDICAL JOURNAL, has received the approval of the King.

SPECIAL RESERVE OF OFFICERS.

ROYAL ARMY MEDICAL CORPS.

THE following to be Lieutenants (on probation) from the dates specified: CLAUDE JOHNSON, M.B., May 25th; JOHN R. R. TRIST, May 30th; THOMAS A. WESTON, May 31st.

The following officers from the Unattached List, Territorial Force, and the Edinburgh University Contingent, Officers Training Corps, to be Lieutenants (on probation), dated August 11th, 1909: Captain W. DARLING, M.B., and Captain J. M. DARLING, M.B.

PAUL M. ROTH, M.B., to be Lieutenant (on probation), May 26th.

TERRITORIAL FORCE.

ROYAL ARMY MEDICAL CORPS.

Eastern Mounted Brigade Field Ambulance.—Supernumerary Lieutenant M. S. DOUBBLE is restored to the establishment, March 1st.

First Highland Field Ambulance.—Major F. KELLY, M D, from the 2nd Highland Field Ambulance, Royal Army Medical Corps, to be Lieutenant-Colonel, May 22nd.

Fifth Southern General Hospital.—Major B. H. MUMBY to be Lieutenant-Colonel, June 25th.

For Attachment to Units other than Medical Units.—JAMES T. R. MACGILL, M B, to be Lieutenant, March 23rd; EDMUND L. ANDERSON, M B. (late Lieutenant, 9th Battalion the King's (Liverpool Regiment)), to be Captain, April 7th; JOHN GRAHAM, M.B., to be Lieutenant, May 7th; JOHN GOSS to be Lieutenant, May 10th; Surgeon-Major H. P. BERRY, M.B., from the 4th Battalion the Lincolnshire Regiment, to be Major, with precedence as from September 13th, 1902, June 25th.

Attached to Units other than Medical Units.—Lieutenant A. A. MARTIN, M D., to be Captain, October 10th, 1909; Captain H S OLIVER to be Major, February 24th; Lieutenant J. M. BOWIE, M.D., to be Captain, May 1st; Captain D. M. MACDONALD, M D., resigns his commission, June 25th.

Third East Anglian Field Ambulance.—WILLIAM I. COWELL, to be Lieutenant, May 10th.

Unattached List for the Territorial Force.—NORMAN C. RUTHERFORD, M B., F R.C.S Eng., to be Lieutenant for service with the Medical Unit of the Royal College of Surgeons (Dublin) Contingent, Senior Division, Officers' Training Corps, June 6th.

Second North Midland Field Ambulance.—Captain A. MACGREGOR resigns his commission, July 2nd.

ROYAL GARRISON ARTILLERY.

Tynemouth.—Surgeon-Major H. R. BRAMWELL, M.B., resigns his commission, July 6th.

INFANTRY.

Fourth Battalion the King's Own (Royal Lancaster Regiment).—Surgeon-Captain and Honorary Surgeon-Major R. J. MORRIS resigns his commission, retaining his rank and uniform, July 6th.

Fifth (Prince of Wales's) Battalion the Devonshire Regiment.—Surgeon-Lieutenant WALTER CHAPMAN resigns his commission, July 6th.

Fourth (Denbighshire) Battalion the Royal Welsh Fusiliers.—Surgeon-Lieutenant J. W. ANDERSON, M.B., to be Surgeon-Captain, June 1st.

THE OPERATIONS IN SOMALILAND.

THE *London Gazette* of June 24th contains dispatches from the officers in charge of the operations in Somaliland in 1909. Among those brought to notice for "exceptionally good work" is the name of Captain M. J. QUIRKE, of the Indian Medical Service.

Hospitals and Asylums.

ABERDEEN DISTRICT ASYLUM, KINGSEAT.

THE annual report of Dr. H. de Maine Alexander, the medical superintendent of this village asylum, for the year 1909 shows that on December 31st, 1908, there were 414 patients in residence, and that on the last day of 1909 there were 451. The total cases under care during the year numbered 532, and the average daily number resident 434. All of these figures show considerable increases on those of the previous year. During the year 118 were admitted, of whom 87 were first admissions and undergoing their first attacks. In 66 the attacks were first attacks within three, and in 12 more within twelve months of admission; in 26 not-first attacks within twelve months; in 10 the attacks were of more than twelve months' duration, and in 4 the illness was of congenital origin. The total admissions were classified into: Mania, 20; melancholia, 29; senile and secondary dementia, 8; delusional insanity, 12; general paralysis, 10; insanity, with other nervous diseases, 5; exhaustion psychoses, 10; insanity with alcoholism, 12; primary dementia, 6; and cases of defective mental development, 5. As to causation, alcoholism was assigned in 12; syphilis in 4; and tuberculosis in 1; critical periods in 27; nervous diseases in 5; general debility in 18; influenza, pneumonia, or parturition in 4; and emotional stress in 6. A neurotic inheritance was ascertained in 29, and 30 had had previous attacks. As to prognosis, 48 were considered curable, 46 incurable, and in 24 the prospect of recovery was doubtful. During the year 33 were discharged as recovered, giving a recovery-rate on the admissions of 27.9 per cent., as compared with 40.7 per cent. for the previous year; 20 as relieved and 1 as not improved. Dr. Alexander says that, acting in collaboration with the inspector of the poor, a beginning has been made at this asylum in boarding out patients in the vicinity of the asylum, who are visited at intervals by the medical officers of the institution. It may be noted here that this is not the usual course followed in Scotland, in which country boarded-out patients are customarily visited by the inspector of the poor, the parochial medical officer, and His Majesty's Commissioners in Lunacy for Scotland, and are detached entirely from the supervision of the medical officers of the asylum. Dr. Alexander has in fact adopted the plan long associated with Belgium, and now adopted by several other countries. Dr. Alexander says that the neighbouring farmers were interviewed, and that only one was willing to try the experiment. Others, however, soon applied for patients when the first applicant expressed himself as pleased with his new farm hand. The patients, Dr. Alexander says, are well cared for, are treated as ordinary members of the household, attend church with their guardians, and occasionally attend the asylum entertainments. Kingseat, we believe, is admirably placed for such an experiment, whose further development we shall await with interest. During the year 27 patients died, giving a death-rate on the average numbers resident of 6.2 per cent. The deaths were due in 7 to cerebro-spinal diseases, including 5 from general paralysis, in 4 to heart disease, in 2 to lobar pneumonia, in 4 to genito-urinary diseases, in 3 to pulmonary tuberculosis, in 1 each to carcinoma and pernicious anaemia, and in 3 to senile decay. The general health was good throughout the year, and there was only one accident—a fractured clavicle in an epileptic patient, due to a fall. There were 5 escapes, all patients being brought back on the next day. Dr. Alexander points out that "escape" is merely a statutory expression. During the year the remaining closed female villa was opened, permitting of more convenient classification, as on the men's side. Dr. Alexander's report contains a suggestion which will doubtless be realized eventually: "The village asylum system has many advantages, but segregation could with infinite advantage be carried a step further: and it will not be until the maniacal and depressed cases entering the institution can be accommodated in separate admission blocks constructed on the hospital plan that the ideal system of segregation will be attained, as the mere proximity of a maniacal or excited patient is a constant source of irritation to the heightened sensibilities of the sufferer from mental depression."

VICTORIA HOSPITAL FOR WOMEN AND CHILDREN, CORK.

THE Secretary's report presented to the thirty-fifth annual meeting of subscribers to this hospital contained a sympathetic reference to the death of Dr. N. J. Hobart, who was one of the founders of the hospital, and was for some years before he died its Consulting Surgeon. Unlike most other institutions of a similar character, Victoria Hospital lives within its means, and one of the axioms of its management is that it shall not get into debt. The medical staff report a large number of major operations, such as Caesarean section, removal of abdominal tumours, etc., with no resulting mortality. The extern department has been housed in new buildings with immense advantage to the patients and correspondingly increased comfort to the staff. Within recent years a new policy has been adopted in dealing with legacies and bequests. It had been the custom to use them as revenue, but now wiser counsels prevail, and only the interest accruing from their investment is utilized in the yearly income of the hospital.

ANNUAL REPORTS OF DUBLIN MEDICAL INSTITUTIONS.

THE Medical Superintendent of the Stewart Institution for Imbecile Children, Palmerston, Dublin, states that the general health of the inmates during the past year has been exceptionally good. Seventy boys and more than fifty girls are now looked after in this institution, which is the only one of its kind in Ireland, although the last Government census showed that there were 5,000 imbecile children in the country. Considerable attention is now directed towards teaching the less severely afflicted patients some industrial employment, such as mat-making, weaving, and farm work. The results have been most gratifying, and during the year 10 cases were discharged as sufficiently trained to look after themselves.

The Cheeverstown Convalescent Home for Little Children was founded four years ago for the reception of poor children in need of rest after recovery from illness. It is entirely unsectarian, the only credentials for admission being poverty and a certificate of being non-infectious. The annual report states that the original capital, which is now exhausted, has accomplished the desired purpose in founding and equipping the institution, which must depend in the future on support from the public. During the four years of its existence 565 children have been cared for.

During the last half-century the Stillorgan Convalescent Home has played a most important part in connexion with the Dublin Hospitals by receiving patients who, while not ill enough to be kept in hospital, are not yet sufficiently strong to return to active work. During the past year 1 145 patients were admitted, and in all, since its foundation, nearly 34,000 patients have received its benefits. The committee reports that the expenditure has recently exceeded income, and in consequence now appeals for increased support. There is no more deserving charitable institution in the neighbourhood of Dublin.

Vacancies and Appointments.

VACANCIES.

This list of vacancies is compiled from our advertisement columns, where full particulars will be found. To ensure notice in this column, advertisements must be received not later than the first post on Wednesday morning.

BEDFORD COUNTY HOSPITAL.—House-Physician. Salary, £60 per annum.

BIRMINGHAM: GENERAL HOSPITAL.—(1) Two House-Physicians; (2) House-Surgeon; (3) House-Surgeon to Special Departments; (4) two Assistant House-Surgeons. Salary at the rate of £50 per annum for (1), (2), and (3), and £40 per annum for (4).

BIRMINGHAM: QUEEN'S HOSPITAL.—(1) House-Physician; (2) House-Surgeon. Salary at the rate of £50 per annum each.

BIRMINGHAM UNIVERSITY.—Walter Myers Travelling Studentship, value £150 for one year.

BIRMINGHAM: YARDLEY ROAD SANATORIUM FOR CONSUMPTIVES.—Resident Medical Officer. Salary, £150 per annum.

BRADFORD: CHILDREN'S HOSPITAL.—House-Surgeon (male). Salary, £100 per annum.

BRADFORD ROYAL INFIRMARY.—Two House-Surgeons (males). Salary, £100 per annum each.

BRISTOL ROYAL INFIRMARY.—Honorary Medical Registrar.

BROOKWOOD ASYLUM, Knaphill, near Woking.—Medical Superintendent. Salary, £800 per annum, rising to £1,000.

BURY INFIRMARY.—Junior House-Surgeon. Salary, £80 per annum, increasing to £90 after six months.

CAMBRIDGESHIRE, ETC., ASYLUM, Fulbourn.—Senior Assistant Medical Officer. Salary, £150 per annum, rising to £200.

CANCER HOSPITAL, Fulham Road, S.W.—Surgeon.

CARDIFF INFIRMARY.—House-Surgeon for Ophthalmic and Ear and Throat Departments. Honorarium, £30 for six months.

CENTRAL FOUNDATION SCHOOLS OF LONDON.—Medical Officer for the Boys' School, Cowper Street, E.C. Salary, £50 per annum.

CHESTER COUNTY ASYLUM.—First Assistant Medical Officer. Salary, £250 per annum.

CHESTERFIELD AND NORTH DERBYSHIRE HOSPITAL.—Junior House-Surgeon. Salary, £60 per annum.

DERBYSHIRE ROYAL INFIRMARY.—Assistant House-Surgeon. Salary, £30 for six months.

GUILDFORD: ROYAL SURREY COUNTY HOSPITAL.—Assistant House-Surgeon. Salary, £50 per annum.

GLASGOW SCHOOL BOARD.—Lady Assistant Medical Officer. Salary, £250 per annum.

HIGHBURY HILL HIGH SCHOOL FOR GIRLS.—Female Practitioner for Inspection of Pupils. Salary, £50 per annum.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton, S.W.—(1) House-Physician; honorarium 30 guineas for six months. (2) Dental Surgeon. Honorarium, 50 guineas per annum.

HOSPITAL FOR WOMEN, Soho Square, W.—(1) Resident Medical Officer; (2) Pathologist and Registrar. Salary at the rate of £60 and £100 per annum respectively.

HULL ROYAL INFIRMARY.—Two Casualty House-Surgeons. Salary at the rate of £60 per annum for six months and £80 for twelve months each.

KIDDERMINSTER INFIRMARY AND CHILDREN'S HOSPITAL.—House Surgeon. Salary, £100 per annum.

KING'S NORTON AND NORTHFIELD URBAN DISTRICT COUNCIL EDUCATION COMMITTEE.—Lady as Temporary Assistant Medical Officer for Inspection of Children. Remuneration at the rate of £250 per annum.

LINCOLN COUNTY HOSPITAL.—Junior Male House-Surgeon. Salary at the rate of £75 per annum.

LONDON TEMPERANCE HOSPITAL, Hampstead Road, N.W.—(1) Resident Medical Officer; (2) Assistant House-Surgeon. Remuneration at the rate of £120 and £105 per annum respectively.

MAIDSTONE: KENT COUNTY OPHTHALMIC HOSPITAL.—Locumtenent from July 23rd to August 6th inclusive. Honorarium, £6 6s.

MANCHESTER CHILDREN'S HOSPITAL, Gartside Street.—Assistant Medical Officer (non-resident). Salary, £100 per annum.

MANCHESTER ROYAL INFIRMARY.—Accident Room House-Surgeon. Salary at the rate of £100 per annum.

MERIONETH COUNTY COUNCIL.—Medical Officer of Health. Salary, £450 per annum.

METROPOLITAN ASYLUMS BOARD.—Assistant Bacteriologist. Salary, £300 per annum, rising to £350.

NOTTINGHAM GENERAL HOSPITAL.—(1) Assistant House-Surgeon; (2) Assistant House-Physician. Salary, £100 per annum each.

POPLAR HOSPITAL FOR ACCIDENTS, E.—Assistant House-Surgeon. Salary at the rate of £80 per annum.

PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham.—Pathologist. Honorarium, £20 per annum.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone Road, N.W.—Resident Medical Officer for Out-patient Department. Salary at the rate of £60 per annum.

ROYAL NATIONAL HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Ventnor.—Assistant Resident Medical Officer. Salary, £100 per annum.

ROYAL NATIONAL HOSPITAL FOR CONSUMPTION FOR IRELAND, Newcastle, co. Wicklow.—Senior Resident Medical Officer. Salary, £300 per annum.

ROYAL WATERLOO HOSPITAL FOR CHILDREN AND WOMEN.—Junior Resident Medical Officer. Salary at the rate of £40 per annum.

SCARBOROUGH HOSPITAL AND DISPENSARY.—Junior House-Surgeon. Salary, £80 per annum.

SHEFFIELD EDUCATION COMMITTEE.—Assistant Medical Officer for Elementary Schools. Salary, £250 per annum, rising to £300.

SHEFFIELD ROYAL HOSPITAL.—(1) Casualty Officer; (2) Assistant House-Surgeon; (3) Assistant House-Physician. Salary, (1) £60, and (2) and (3) £50 per annum each.

SHEFFIELD ROYAL INFIRMARY.—Seventh Resident Medical Officer. Salary, £60 per annum.

STOCKPORT INFIRMARY.—Junior House-Surgeon (male). Salary, £80 per annum.

TAUNTON AND SOMERSET HOSPITAL.—Resident Assistant House-Surgeon. Salary at the rate of £70 per annum.

THREE COUNTIES ASYLUM, Arlesey, near Hitchin.—Medical Superintendent. Salary, £800 per annum, rising to £1,000.

WAKEFIELD: WEST RIDING ASYLUM.—Assistant Medical Officer. Salary, £140 per annum, rising to £150.

WARRINGTON INFIRMARY AND DISPENSARY.—Senior House-Surgeon. Salary, £120 per annum.

WINCHESTER: ROYAL HAMPSHIRE COUNTY HOSPITAL.—House-Physician (male).

WEST HAM AND EAST LONDON HOSPITAL, Stratford.—Junior House-Surgeon. Salary at the rate of £75 per annum.

CERTIFYING FACTORY SURGEONS.—The Chief Inspector of Factories announces vacancies at Drogheda, co. Louth, and Ross, co. Hereford.

MEDICAL REFEREE.—The Home Secretary announces a vacancy as Medical Referee for the County Court Circuit No. 9.

APPOINTMENTS.

AINSCOW, H., M.B., B.S.Lond., District Medical Officer of the Wigan Union.

AWBURN, G. J., M.B., C.M.Edin., Medical Officer of Health of the Tintwistle Rural District.

BOREHAM, F. S., L.R.C.P. and S.Edin., District Medical Officer of the Busford Union.

BRODIE, W. B., M.D.Glasg., District Medical Officer of the Dunmow Union.

COULSON, T. E., M.D.Edin., District Medical Officer of the Wincanton Union.

CROWE, H. Neville, M.B., Ch.B.Birm., M.R.C.S., L.R.C.P., Honorary Anaesthetist and Honorary Medical Pathologist to the General Infirmary, Worcester.

DAWES, E. P., L.R.C.P. and S.Edin., District Medical Officer of the Alcester Union.

DEVEY, T. V., L.R.C.P. and S.Edin., District Medical Officer of the Reeth Union.

DIGHTON, Chas. A. Adair, M.B., Ch.B.Edin., Ophthalmic and Aural Surgeon to the Scarborough Hospital and Dispensary.

DIXON, T. Benjamin, M.R.C.S., L.R.C.P., Honorary Assistant Anaesthetist to the Bristol General Hospital.

DUCKETT, A. H., M.B., Ch.B.Aberd., Resident Assistant Medical Officer of the Brighton Parish Workhouse.

FOOKS, W. P., M.B., B.C.Camb., District Medical Officer of the King's Norton Union.

GREVES, E. Hyla, M.D.Edin., M.R.C.P.Lond., Honorary Visiting Physician to the County Mental Hospital, Herrison, near Dorchester.

HINCKS, T. E., M.D.Edin., Medical Officer of the Hay Union Workhouse.

HUNTER, J., M.D.Edin., Certifying Factory Surgeon for the Linlithgow District, co. Linlithgow.

KEALY, J. W. G., L.R.C.P., M.R.C.S., D.P.H., Medical Officer of Health of the Gosport and Alverstoke Urban District.

KENNEDY, R. Foster, M.B., B.Ch.R.U.I., Assistant Physician to the Neurological Institute of New York, U.S.A.

LAWTON, J. J., L.R.C.P. and S.Edin., L.F.P.S.Glasg., Certifying Factory Surgeon for the Midleton District, co. Cork.

LIVERMORE, William Barclay, M.B.Aberd., Medical Superintendent of the Devon and Cornwall Sanatorium for Consumptives, Didworthy, South Brent, Devon.

LOUGHRIDGE, J. A., M.B., Ch.B.Edin., Medical Officer of Health of the Amble Urban District.

LYALL, C. H. Gibson, L.R.C.P. and S.Edin., L.F.P.S.Glasg., Senior Assistant Medical Officer at the Leicester Borough Asylum.

MACFARLANE, W. D., jun., M.B., C.M.Glasg., Surgeon to the Royal Samaritan Hospital, Glasgow, vice Dr. John Edgar, deceased.

MAGOWAN, S. M., M.B., B.Ch., R.U.I., Certifying Factory Surgeon for the Glenarm District, co. Antrim.

MAYO, T. A., M.B., F.R.C.S., Medical Officer of Health of the Cowes Urban District.

ORMEROD, E. W., M.R.C.S., L.R.C.P., Certifying Factory Surgeon for the Southam District, co. Warwick.

PHILLIPS, Llewellyn Powell, M.A., M.D., B.C.Cantab., F.R.C.P.Lond., F.R.C.S.Eng., Professor of Medicine in the Egyptian Government School of Medicine and Senior Physician to the Kasr el Aini Hospital, Cairo.

POMFRET, H. W., M.D.Vict., Medical Officer of Health of the Hollingworth Urban District.

PYWELL, E. A., M.R.C.S., L.R.C.P., District Medical Officer of the Peterborough Union.

SLINGER, R. Townley, M.B., Ch.B.Vict., F.R.C.S., Honorary Anaesthetist and Honorary Surgical Pathologist to the General Infirmary, Worcester.

SPARK, Percy Charles, M.R.C.S., L.R.C.P.Lond., Medical Superintendent of the Banstead Asylum, vice Dr. D. Johnston Jones.

THOMAS, D. J., M.D.Brux., M.R.C.S., L.R.C.P., Medical Officer of Health of the Bedwellty Urban District.

THOMPSON, Alexander Dey, M.B., Ch.B.Glasg., M.P.C., Medical Superintendent, the County Asylum, Cambridge.

WEST, L. F., M.R.C.S., L.R.C.P., District Medical Officer of the Driffield Union.

WOOD, J. L. M., M.B., Ch.B.Edin., District Medical Officer of the Barnstaple Union.

BIRTHS, MARRIAGES, AND DEATHS.

The charge for inserting announcements of Births, Marriages, and Deaths is 3s. 6d., which sum should be forwarded in post-office orders or stamps with the notice not later than Wednesday morning, in order to ensure insertion in the current issue.

BIRTHS.

CADDICK.—On July 1st, at 44, Bradford Street, Walsall, the wife of C. J. Caddick, F.R.C.S.E., of a son.

CLAY.—On July 3rd, at 198, Moseley Road, Birmingham, the wife of Ernest L. Clay, M.B., of a son.

MARRIAGE.

SCOTT—PHILLIPS.—On June 30th, at Trinity Church, Hampstead, by the Rev. Basil Phillips, M.A., cousin of the bride, assisted by the Rev. H. Summerhayes, M.A., Vicar of the Parish, William Lochhead Scott, M.D., B.S., M.R.C.S., L.R.C.P., of Liss, Hants, second son of Horatio C. Scott, of 20, Carleton Road, N., to Gwendolen Maud Lucy, daughter of the late Edward Nunes Phillips, of Aelybryn, Llanelly, Carmarthenshire.

DEATHS.

BUSHNELL.—At Worthing, on June 29th, Laura Dunstan Bushnell, widow of the late Robert Bushnell, of Chiswick, in her 83rd year.

LANGWILL.—At 4, Hermitage Place, Leith, on June 22nd, Alice Margaret Moorhead, L.R.C.P. and S.E., wife of Hamilton Graham Langwill, M.D., F.R.C.P.E.

DIARY FOR THE WEEK.

POST-GRADUATE COURSES AND LECTURES.

CENTRAL LONDON THROAT AND EAR HOSPITAL, Gray's Inn Road, W.C.—Lectures: Tuesday, 3.45 p.m., Larynx. Friday, 3.45 p.m., Nose.

HOSPITAL FOR SICK CHILDREN, Great Ormond Street, W.C.—Monday and Wednesday, 5.15 p.m.: Diseases of the Chest in Children. Wednesday, 5 p.m.: Deformities. Thursday, 4 p.m.: Lymphatic Glandular Enlargements.

LONDON SCHOOL OF CLINICAL MEDICINE, Seamen's Hospital, Greenwich.—Daily arrangements: Out-patient Demonstration, 10 a.m.; Medical and Surgical Clinics, 2.15 p.m. and 3.15 p.m. respectively; Operations, 2 p.m. Special Clinics: Ear and Throat, at noon and 4 p.m., Monday, and noon, Thursday; Skin, at noon and 4 p.m., Thursday, and noon, Friday; Eye, 11 a.m., Wednesday and Saturday; Radiography, 4 p.m., Thursday.

MEDICAL GRADUATES' COLLEGE AND POLYCLINIC, 22, Chenies Street, W.C.—The following Clinical Demonstrations have been arranged for next week at 4 p.m. each day: Monday, Skin; Tuesday, Medical; Wednesday, Surgical; Thursday, Medical; Friday, Eye. Lectures at 5.15 p.m. each day will be given as follows: Monday, The Local Application of Salicylates; Tuesday, Appendicitis in Children; Wednesday, Modern Methods of Diagnosis in the Surgery of the Urinary Organs; Thursday, The Diagnosis and Prognosis of Acute Pneumonia.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.—Monday, Clinics, 10 a.m., Surgical Out-patient; 2.30 p.m., Medical Out-patient: Nose, Throat, and Ear. Tuesday, 10 a.m., Medical Out-patient Clinic; 2.30 p.m., Operations. Clinics: Surgical, Gynaecological; 3.30 p.m., Medical In-patient. Wednesday, 2.30 p.m., Medical Out-patient Skin and Eye Clinics: *X* Rays; 4.30 p.m., Demonstration: Treatment of Naevus by Radium and other Methods. Thursday, 2.30 p.m., Gynaecological Operations; Clinics: Medical Out-patient; Surgical Out-patient; 3 p.m., Medical In-patient. Friday, 2.30 p.m., Operations; Clinics: Medical Out-patient, Eye; 3 p.m., Medical In-patient.

WEST LONDON POST-GRADUATE COLLEGE, Hammersmith Road, W.—Medical and Surgical Clinics, Operations, *X* Rays, 2 p.m. daily. Monday: Surgical Registrar, 10 a.m.; Pathological Demonstration, 12 noon; Eye, 2 p.m. Tuesday: Gynaecological Operations, 10 a.m.; Throat, Nose, and Ear, 2 p.m.; Skin, 2 p.m. Wednesday: Diseases of Children, 10 a.m.; Throat, Nose, and Ear Operations, 10 a.m. Lecture: Practical Medicine, 12.15 p.m.; Eye, 2 p.m.; Gynaecology, 2 p.m. Thursday: Surgical Registrar, 10 a.m.; Eye, 2 p.m.; Orthopaedics, 2 p.m. Friday: Medical Registrar, 10 a.m.; Gynaecological Operations, 10 a.m.; Throat, Nose, and Ear, 2 p.m.; Skin, 2 p.m. Saturday: Diseases of Children, 10 a.m.; Eye, 10 a.m. Clinical Lectures, 5 p.m. daily.

RECENT PUBLICATIONS.

The Dental Directory, 1910. London: John Bale, Sons, and Danielsson. (Post 8vo, pp. 254. 2s. 6d.)

A well-turned-out reference book, giving both alphabetical and topographical lists of dental surgeons and their qualifications and places of education. Details are also supplied concerning dental schools, clinics, societies, and publications, together with information as to the legal position of dentists and the education they have to undergo.

PUBLISHERS' ANNOUNCEMENTS.

MESSRS. REBMAN, LTD., will publish in the autumn a work on the abdomen proper, by Dr. W. Cuthbert Morton. The publishers state that in the work a definition of the principles which ought to be followed in anatomical description is accompanied by an illustration of both text and plates of the thorough and consistent application of those principles to the abdomen proper. The method of the work is at once destructive and constructive; the abdomen can be reduced to its parts, the parts can be studied both individually and in relation to each other, and, lastly, the parts can be rebuilt into the whole. In the text each part is described in natural sequence to what has gone before and in natural precedence to what is to follow, and all the parts are further correlated by references. The plates, though few in number and by no means overcrowded with detail, present a complete abdomen proper, with every structure *in situ*. The work ought to be of service to every one who is interested in anatomy, whether student or teacher, general practitioner, surgeon or physician.

CALENDAR OF THE ASSOCIATION.

Date.	Meetings to be Held.
JULY.	
11 MONDAY ..	
12 TUESDAY ..	NORTH WALES BRANCH, Annual Meeting, Hand Hotel, Llangollen, 2 p.m.; Luncheon, 1 p.m.; Branch Council, 1.45 p.m.
13 WEDNESDAY	LONDON: Organization Committee, 10.45 a.m.
14 THURSDAY ..	SOUTHERN BRANCH, Annual Meeting, Infirmary, Salisbury, 12.45 p.m.
15 FRIDAY ..	
16 SATURDAY ..	LONDON: Science Committee, 2 p.m. NORTHERN COUNTIES OF SCOTLAND BRANCH, Annual Meeting, Imperial Golf View Hotel, Nairn, 11.30 a.m.
17 Sunday ..	
18 MONDAY ..	
19 TUESDAY ..	
20 WEDNESDAY	
21 THURSDAY ..	
22 FRIDAY ..	ANNUAL GENERAL MEETING, Court of Common Council Chamber, Guildhall, London, 10 a.m. ANNUAL REPRESENTATIVE MEETING, immediately after Annual General Meeting. EXTRAORDINARY GENERAL MEETING, Court of Common Council Chamber, Guildhall, London, 2 p.m.

Date.	Meetings to be Held.
JULY *(continued).*	
23 SATURDAY ..	ANNUAL REPRESENTATIVE MEETING, 9.30 a.m.
24 Sunday ..	
25 MONDAY ..	ANNUAL REPRESENTATIVE MEETING, 10 a.m.
26 TUESDAY ..	CENTRAL COUNCIL, 10 a.m. ANNUAL REPRESENTATIVE MEETING, 10.30 a.m. ADJOURNED GENERAL MEETING, 2.30 p.m.
27 WEDNESDAY	CENTRAL COUNCIL, 9.30 a.m.
28 THURSDAY ..	
29 FRIDAY ..	
30 SATURDAY ..	
31 Sunday ..	
AUGUST.	
1 MONDAY ..	
2 TUESDAY ..	
3 WEDNESDAY	
4 THURSDAY ..	
5 FRIDAY ..	
6 SATURDAY ..	
7 Sunday ..	
8 MONDAY ..	
9 TUESDAY ..	

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